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An Investigation of the Factors Influencing Teachers' Acceptance and Use of Information and Communication Technology (ICT) in EFL Classrooms:

A Case Study of the Department of English at Hassiba Benbouali University of Chlef

A Thesis Submitted in Fulfilment of the Requirements for the
Degree of Doctorate es Sciences in English Linguistics and Didactics

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Declaration

I hereby declare that the substance of the thesis entitled 'An Investigation of the Factors Influencing Teachers' Acceptance and Use of Information and Communication Technology (ICT) in EFL Classrooms: *A Case Study of the Department of English at Hassiba Benbouali University of Chlef* ' is entirely the result of my investigation and that due reference or acknowledgment is made, whenever necessary, to the work of other researchers.

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Acknowledgements

Dedication

I wholeheartedly dedicate this work to my mother and father who provided all the possible means for me to finish my research. Also, my sincere gratitude to my beloved wife, she encouraged me and prayed all the time for me to finish my thesis. I also dedicate this work to my children, Rayan and Abdarahim, who have kept me cheerful all the time by their playfulness, smile and laughter. I love them dearly and I hope they will be successful in their life. In addition, I would like to thank my brothers and sisters. They all equally supported me and encouraged me all the time.

Abstract

Information and Communication Technology (ICT, henceforth) plays an important role in modern institutions by facilitating and improving the teaching and learning process to be in line with the digital society of the 21st century. ICTs have been provided by Higher Education Authorities to ensure that teachers use ICT to enhance their teaching practices. Unfortunately, the acceptance and use of ICT as a support to the teaching of English as a Foreign Language (EFL) has been found to be underutilised, especially by teachers in the Algerian Higher Education Institutions (HEIs). This study is seeking to fill this gap by applying the modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT) with the inclusion of '*attitude*' as an endogenous variable and '*teaching experience*' as a moderator. The current study aims at investigating the potential prominent factors related to teachers' acceptance and usage of ICT in EFL classroom teaching practices from the Department of English at Hassiba Benbouali University of Chlef ,Western Algeria. This study adopts a mixed-method sequential explanatory approach, with data collected through an online questionnaire survey with 33 informants (n=33) and subsequent semi-structured interviews were carried out with six informants (n=6). The quantitative data are analysed using IBM SPSS Software (V.26), while the qualitative data collected from the semi-structured interviews are analysed via thematic analysis through the use of MAXQDA Program. The findings reveal that that two variables – Performance Expectancy and Effort Expectancy of the proposed research model of UTAUT–have significantly influenced EFL teachers' *Attitudes towards Using Technology*. The study unexpectedly found that behavioural intention is influenced only by attitude. Other variables such as Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions were found to be non-important determinants of teachers' behavioural intentions. One of the surprising outcomes of this study is that Behavioural Intention and Facilitating Conditions were the strongest determinants of teachers' actual use of ICT. The study also clarified the role played by demographic variables. Gender moderated the relationship between Performance Expectancy and the Behavioural Intention to use ICT. Age also moderated the relationship between Performance Expectancy and the use behaviour of ICT. Furthermore, the teaching experience of the teachers moderated the relationship between the two psychological factors of Facilitating Conditions and *Attitude toward Using Technology* with the Behavioural Intention to use ICT, with the effect increasing as the *teaching experience* decreased.

Keywords: Information and Communication Technology (ICT), EFL Teachers, Higher Education, Sequential Mixed Methods , UTAUT model

List of Published Work

During the time of writing this thesis, I have presented and published the following Conference paper and Journal articles:

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Makhlouf, K. (2021b). *Emergency Remote Teaching in the Time of COVID-19 Pandemic: Challenges and Opportunities in the Algerian Higher Education*. Paper presented at the 2021 International Research Conference on Meeting the Urgent Needs for Foreign Languages Online Teaching in Response to the Covid-19 Pandemic. Chlef: TICELET, Hassiba Benbouali University of Chlef,Algeria.

Makhlouf, K., & Bensafi, Z. (2021). An Exploration of Factors Influencing Teachers' Attitudes toward the Use of Information and Communication Technology (ICT) in Classroom Practice:A Case Study of Secondary School EFL Teachers in the Western District of Chlef , Algeria. *Advances in Language and Literary Studies*, *12*(2), 37. https://doi.org/10.7575/aiac.alls.v.12n.2.p.37

Makhlouf, K., & Bensafi, Z. (2022). Challenges and Opportunities: Experiences of EFL Teachers with the Emergency Remote Teaching During the COVID-19 Pandemic. *Djoussour El-Maaréfa*, *8*(2), 613–627.

List of Abbreviations

ALECSO: The Arab League Educational, Cultural and Scientific Organization

AHEIs: Algerian Higher Education Institutions

ATUT: Attitude towards Using Technology

BI: Behavioural Intention

CALL: Computer-Assisted Language Learning

CERIST: Scientific and Technical Information Research Centre

DG-RSDT: General Directorate for Scientific Research and Technological Development

EE: Effort Expectancy

EFL: English as a Foreign Language

ENS: Teachers' Training College

ELT: English Language Teaching

FC: Facilitating Conditions

ICT(s): Information and Communication Technology / Technologies

ICTDAR: Information and Communication Technologies for Development in the Arab Region

IT: Information Technology

MENA: Middle East and North Africa

MMR: Mixed Methods Research

MoHESR: Ministry of Higher Education and Scientific Research

MOOCs: Massive Open Online Courses

MPTIC: Ministry of Posts, Information Technology and Communications

ODE: Open and Distance Education

OERs: Open Educational Resources

PE: Performance Expectancy

SCT: Social Cognitive Theory

SI: Social Influence

SPSS: Statistical Package for the Social Sciences

TAM: Technology Acceptance Model

TPACK: Technological, Pedagogical and Content Knowledge

UNCTAD: United Nations Conference on Trade and Development

UNDP: United Nations Development Program

UTAUT: Unified Theory of Acceptance and Use of Technology

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GENERAL INTRODUCTION

General Introduction

● Background of the Study

The last two decades have witnessed an unprecedented worldwide proliferation of Information and Communication Technologies (ICT, henceforth) into the field of education. The global adoption of ICT by education has been largely driven by economic demands for 'national development' (Modum, 1998). The use of ICT has become the new digital literacy for the 21st century (Levin & Wadmany, 2008) and, around the globe, countries see ICT as a potential tool enhancing education (Al Harbi, 2014).For Harvey (1983),the effectiveness of the use of computers in Education may be an important factor in determining which countries will succeed in the future. Central to this vision is the powerful metaphor of the '*Information Society*', where the ability to access, search, use, create and exchange information via the computer is the key for individual and collective well-being (Kaplan, 2001).

The metaphor of '*Information Society*' is often applied to describe the way in which our society has come to function following the rapid proliferation of ICT. The term *'Information Society'* is a somewhat nebulous one. Webster (2002 as cited in Ainley, Enger & Searle, 2008) argues that there is little agreement on what the defining features of an Information Society are, with many commentators struggling to identify how our society can be differentiated from previous societies at a fundamental level. Within our society, which has now become also known as the '*Knowledge Society*', Education is changing too. With the advent of new technologies and the Internet, it is now possible to reach people who would otherwise have no access to certain courses or educational opportunities (Guemide, Benachaiba & Bouzar, 2011). Currently, we are witnessing a significant shift in the Information Society, and this is illustrated by the rapid growth of imposed ICT in all sectors (Kouninef, Djelti & Kourbali, 2013).

The issue of introducing Information and Communication Technologies (ICTs) in the terrain of Education is the subject of major concern among researchers for years. ICTs have become within a very short time, one of the basic building blocks of modern industrial society (Barakabitze et al., 2019). Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy (Srivastava, 2016, p. 40). Hence, one of the

main reasons for the countries all over the world to compete in investing in ICT in education is the inevitable product in the trend of globalisation and the development of ICT, especially that the rapid development of information industry demands for opening up much broader market space for itself (Zhang, Yang, Chang & Chang, 2016). Globalisation and the diffusion of ICT in all spheres of life have created a social system which is driven by knowledge and powered by technology. The prominence of ICT also puts the various education systems under pressure to use ICT in teaching and learning (Mathipa & Mukhari, 2014). Due to the explosion of knowledge, higher education institutions including universities cannot continue as sites that transmit knowledge from the teacher to the learner as the only source of information. Therefore, Universities are expected to enhance the acquisition of knowledge and skills through the use of new technologies to ensure efficient, continuous and lifelong learning.

People from all walks of life can now generate and share information with only a few clicks on their PCs, laptop computers, tablets, and mobile phones due to technological advancements. Indeed, ICT nowadays controls us fundamentally in the way we live, communicate, work, and entertain. ICT has a huge impact on contemporary society, and education is one of the main fields where ICT applications have been used extensively over the years (Karagiannidis, Politis & Karasavvidis, 2014). In this globalised world, we are more particularly concerned by this type of means of global communication when used in Education and literacy as we all need to develop skills to use these means so as not to lag behind. As such, we have no other choice if we do not go for effective use of ICT, it comes to us or rather imposes itself on us and our lives and become vital to our survival in this fast-moving world which is going too fast for some of us (older generation). We try to keep up with the pace, but still it is not easy to manage in our developing context in Algeria.

While the development of Information Society is the process transforming from the society dominated by the material production to that dominated by information industry (Zhang et al., 2016), educational systems in both developed and developing countries are increasingly under pressure to use ICTs. Hence, a number of researchers have suggested that ICT is an important driver for economic development in developing countries (Albirini, 2004; Nour, 2002, 2006) since the transformation from a Post-Industrial to the 'Information Society'(Kaplan, 2001) has resulted in ICT being viewed

as the best medium for accessing this information and for 'capacity building' in many areas of society including education, health, business, governance, social services and the environment. As this technology transformation diffusion process is often the economic lever upon which national competitive advantage will reside, technology education provides the manpower to achieve this high technology advantage (Al-Khasawneh, 2012). Consequently, with the potential that it offers, ICT has become an important part of educational reform efforts. Many countries have allocated substantial budgets for ICT implementation in Education.

In the past three decades, Information Technology (IT) has played an important role in education, especially in developed countries. While some developing countries are not too far behind, there is some resistance from teachers in the use of technology for education (Yakubu & Kah, 2020). Possible explanations for such resistance are: poorly designed software, technophobia, doubt that technology improves learning outcomes, and fear of redundancy. In fact, exploring actual ICT uses and understanding why learners and teachers resist using ICT helps frame the necessary strategy to follow in order to better respond to learners' communicative needs and expectations (Ghomari, 2015). The reasons for the apparent resistance to the use of Information Technology within the normal pedagogy of the classroom needs further exploration.

One developing country that is currently pursuing the technological track in Education is Algeria. Recognising the challenges of the '*Information Age*', the Algerian Government has given emphasis to the development of ICT human resources. It has also put in place a committee in charge of defining the elements of an Algerian National Information Society strategy. The work of the committee will help set up the links among the different sectors, in the area of infrastructure, training and research as well as information systems and ICTs. To this end, the Ministry of Higher Education and Scientific Research (MoHESR) in Algeria inaugurated computer-equipped laboratories within the Departments of Foreign Languages. It also connected many universities to the Internet.

Academic institutions around the world are in the process of adopting technology in teaching, professional development, and curriculum development (Khan & Qudrat-ullah, 2021). The acceptance and use of educational technology play an integral role in shaping the future of Higher Educational Institutions (HEIs). The growth of educational

tools such as Learning Management Systems (LMSs) mainly 'Moodle' in recent years has inspired HEIs all over the world to redefine their teaching and learning processes. Consequently, HEIs are making huge investments in infrastructure, equipment, technology, and professional development programs to improve their educational effectiveness. However, these decisions regarding huge investments in HEIs are generally made without considering the factors that influence the actual users of the technology within the classroom arena, namely the teachers. A lack of understanding of these influential factors results in the implementation failure due to users' unwillingness or resistance to accept new technology and hence the new technology does not meet the anticipated benefits for these institutions.

Universities in the USA and European countries have embraced the use of emerging technologies as a way to improve quality education and to create more opportunities in the teaching and learning environment. Hence, ICT plays a major role in modern institutions by facilitating and improving the teaching and learning process to be in line with the Information Technology age. The Higher Education sector in Algeria is considered as one of the most influential sectors that develop the country. In striving toward a competitive institution, a university must enhance teaching and learning process related to the advancement of ICT (Khasawneh & Ibrahim, 2012). However, this study attempts to focus on the major factors that may enable or hinder EFL teachers'acceptance and use of ICT in their teaching practices in the Algerian public universities. Moreover, the study attempts to build theoretical model to the Algerian case according to the results of the growing body of research conducted throughout the world.

A considerable body of research reports empirical evidence validating the benefits of using educational technologies and supporting the notion that ICT can facilitate teaching and learning at a wide range of educational levels (Ezza, 2014; Moodley, 2017). Many higher educational institutions and universities around the world are investing heavily to equip themselves with e-learning tools to support their traditional learning and teaching because of its flexibility, low cost and convenience (Tarhini et al., 2016). In this respect, many researchers have claimed that technology offers the mobility and flexibility in learning and facilitates educational equity by allowing learning to be accessed anywhere and anytime (Hu, Laxman & Lee, 2020; Tarhini, Masa'deh, Al-

Busaidi, Ashraf Bani & Maqableh, 2017). ICT also demonstrates the benefit of teaching and learning innovations and catalyses pedagogical transformation. The potential of new technologies enables new pedagogical approaches to be implemented and minimises the dependence upon old approaches (Hu et al., 2020). For that we should evaluate the potential that ICT brings to our educational context alongside the pedagogical culturally rooted practices that embody the psychological specificities of both teachers and learners (Ghomari, 2015). Educational technologies are increasingly used in higher education classrooms to offer unique and effective new approaches to teaching and learning. ICT, therefore, has the potential to enhance both teaching and learning and it is for the teacher to decide if, when and how this can be done (Bate, 2010). Notwithstanding these points, from the studies that have been conducted to examine the overall impact of ICT on teaching and learning within institutions of Higher Education over the last two decades , one can conclude that these institutions have been slow to fully exploit the potential benefits afforded by the adaption of ICT facilities (Islam, 2018).

Although Universities are investing in the implementation of technologies, teachers still struggle to keep abreast with the speed, and demands, of technological development (Stevenson & Hedberg, 2017). Teachers' perceptions and attitudes of the impact of technologies upon teaching and learning has been shown to reflect their beliefs around the use and adoption of technology. However, research on teacher-led adoption of ICT for formal learning in Higher Education remains limited. In a classroom learning environment, teachers' perceptions and attitudes of ICT, technological knowledge readiness, and knowledge of practical strategies are likely to influence the students use these tools for learning (Bidin and Ziden 2013; Lai and Smith 2018). Therefore, an investigation of how teachers perceive and use educational technologies in their teaching practice is urgently needed for this study.

Teachers are considered the central forces in tapping the learning opportunities created by technology. Along with institutional heads and education policy-makers, teachers also contribute to bridging the digital divide in education prevalent between and within countries of the Arab world region. These educators are instrumental in deciding how teaching and learning take place in classrooms, in institutions and in the Algerian community. It follows that these educators need to be at the centre of

educational change, using technology for teaching, learning and for development purposes (Majumdar, 2005). The most successful ICT-in-education policy would mean nothing without the full support of the teachers. Teachers are central to education, and at the core of any proposed programme for the use ICT. The aim of teachers should be to integrate ICT with traditional pedagogy to transform and facilitate learning for the benefits of learners in this Digital Age. Therefore, teachers should be at the core of Information and Communication Technologies (ICT) integration projects (Sang, Valcke, van Braak, Tondeur & Zhu, 2011). As early as three decades ago, Marcinkiewicz(1993) stressed that the full integration of computers into education remains a distant goal unless there is a reconciliation between teachers and computers.

Studying the factors that might influence teachers' behavioural intentions for using technology in their teaching practices is of utmost importance in Algerian Higher Education in particular where ICT is not usually part of the University culture. An examination of the history of technology in education shows that the technology initiatives adopted by educational policy-makers worldwide have often focused on the potential of technology per se. In developing countries in particular, policy-makers have adopted ICT in education to accelerate their nations' development efforts. In such hasty adoption, determinants that enhance or impede teachers' acceptance and use of ICT in their teaching practices are often ignored. The literature emphasises the need for more studies on not only teachers' attitudes toward ICT but also the factors that have produced these attitudes. Previous research shows that performance expectancy (usefulness), and effort expectancy (ease of use), social influence (subjective norm), facilitating conditions, and attitude toward using technology have often been related to individuals' behavioural intention and behaviour use. Therefore, teachers' acceptance and use of ICT in relation to the above predictor variables are the main focus of this study.

Several theories and models have been developed and tested in different contexts to help explain technology acceptance. Among these models, the Unified Theory of Acceptance and Use of Technology (UTAUT) is the most robust, and influential model in predicting acceptance of Information Technology by its users. This study proposed and validated a generic usability and acceptance model (UTAUT) with a view to measure behavioural intention in accepting and using ICT. Therefore, an extensive literature review was accomplished to develop a theoretical framework on the basis of

the extended UTAUT model with the inclusion of '*attitude*' as an endogenous variable and '*teaching experience*' as a moderator. The proposed UTAUT incorporated five constructs: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology. Individual differences – such as age, gender, and teaching experience – were hypothesised to moderate the effects of these constructs on behavioural intention and use behaviour of ICT.

For scaling up pedagogical innovation with Information and Communications Technology (ICT), Governments around the world put a concerted effort into teachers' acceptance of ICTs and the actual use of ICTs for teaching purposes (Kim & Lee, 2020), yet there is limited literature about the conceptual framework of the determinants that influence teachers' acceptance of ICTs and their actual usage for teaching practices in EFL classrooms typically in the Algerian Higher Education Institutions.

● **Statement of the Research Problem**

Over the past four decades, the educational potential of ICT has been explored by numerous educationalists. Many researchers point to the ability of ICT to support and even enhance teaching and learning processes in Higher Education. Other voices are more critical and raise questions concerning the effectiveness of ICT (Robertson, 2002). However, among novice and expert teachers alike, there is frequently more apparent resistance than eagerness to embrace technology within the normal pedagogy of the classroom (Jamieson-Proctor, Burnett, Finger & Watson, 2006; Watson, 1998). The problem addressed in this study is to better understand the key factors affecting teachers' acceptance and use ICT into EFL classrooms. For this purpose, various psychological and socio-demographic variables are considered as predictors of the actual use of ICT by English as a Foreign Language (EFL) teachers from the Department of English at Hassiba Benbouali University of Chlef.

An Internet search for the available literature in academic databases such as the Web of Science (WoS), Scopus, Education Resources Information Center (ERIC), Google Scholar, Scientific and Technical Information Research Centre (CERIST), and electronic journals in the Algerian Scientific Journal Platform (ASJP) by using four keywords, e.g. 'EFL teachers' + 'ICT Acceptance' + 'Algeria' + 'Higher Education' + 'UTAUT' shows that in Algeria no studies pertaining to the determinants of ICT usage

among University EFL teachers had been carried out using UTAUT Model as a theoretical framework. Accordingly, using the framework of technology acceptance constructs, the current study aims at examining the psychological and socio-demographic factors that influence university teachers' behavioural intention and the actual use of ICT in their classroom practices.

A great deal of theoretical and empirical work over several years have identified several independent variables that may influence the teachers' acceptance and use of ICT as dependent variables. However, studies conducted on the key determinants of EFL teachers' actual use of ICT are very limited or non-existent in the Algerian Higher Education context. Hence, the present study tries to investigate the impact of various independent variables on university teachers' Actual Use of ICT in EFL classrooms.

The independent variables proposed in the study include university teachers' Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, apart from Attitude Towards Using Technology, and Behavioural Intention. The study also considers the moderating effect of socio-demographic variables – age, gender, ICT and teaching experience – on both independent and dependent variables.

Acceptance of technology is based on the interplay of various factors, such as belief-attitude-intention-use behaviour. In this regard, various theories and models were developed and tested to understand the determinants of individuals' acceptance and use of technology in various domains. Teachers' technology acceptance is an important factor to the successful use of ICT in Higher Education. Unfortunately, very little is known about the factors that influence Algerian teachers to accept and use ICT in teaching practices. As a result, to the best of my knowledge, there are little or no studies that have investigated this phenomenon in the context of the Algerian Higher Education. This study tries to bridge this gap by using the original Unified Theory of Acceptance and Use of Technology (UTAUT) Model as its theoretical framework, with the inclusion of '*Attitude Towards Using Technology*' as an endogenous construct and teaching experience as a moderator to examine the acceptance of ICT by EFL teachers at the level of Higher Education Institutions in Algeria. Therefore, to help EFL teachers be proactively well prepared for the digitalised era, it is necessary to understand their current attitudes towards the implementation of ICT, to determine the salient factors influencing their behavioural intention and actual use of ICT in classrooms. More

importantly, it is critical to identify the barriers that impede EFL teachers from the use of ICT in their teaching practices.

● Scope of the Study

The end of the last millennium was characterised by rapid technological advancement and profound changes in many aspects of human activities, often referred to as indicative of the world moving into the '*Knowledge Age*'. Such changes have stimulated a lot of debates about the role and processes of education as well as the role of Information and Communication Technology (ICT) in teaching and learning in the new era (Pelgrum & Law, 2008). It is believed that using ICT has a fundamental influence on the teaching and learning process at Higher Education Institutions (HEIs), and many best practices are emerging in different countries. However, there is a challenge on how to scale up these cases to reap the benefits of pedagogical innovation with ICT in Education in a large scale. This challenge motivates the embarking on this research to critically understand the determinants that influence the emerging best teaching practices to enhance ICT use amongst teachers in Higher Education. Many factors play a pivotal role in the use of ICT by teachers at universities. Importantly, the availability of technological tools and the ability to access them at the workplace and at home influence one's decision to use them. Hence, availability of technology infrastructure at HEIs, both hardware and software, is important in ensuring possible use of ICT by the teachers. At the same time, it is very important to understand the key motivating factors that would encourage the teachers to accept and use technology for teaching and learning.

The scope of the current study is to focus on the major motivating factors that allow the teachers to venture into use of technology in the EFL classroom. Thus, the present study is confined to the in-service EFL teachers working in the Department of English at Hassiba Benbouali University of Chlef in the West of Algiers. It is an explanatory study aimed at investigating the factors that contribute to the teachers' acceptance and actual use of ICT. The study is designed to identify the key determinants of the use of ICT by teachers and relate it to the existing literature in the field of educational technology.

- **The Purpose Statement**

    The purpose of this mixed methods sequential explanatory study is to identify factors contributing to EFL teachers' acceptance and actual use of ICT in their teaching practice by obtaining quantitative results from an online survey of in-service English as a Foreign Language (EFL) teachers from the Department of English at Hassiba Benbouali University of Chlef and then following up with selected individual semi-structured interviews with six teachers to explore those results in more depth through a qualitative data analysis. In the first quantitative phase of the study, the research questions focused on how selected *exogenous* and *endogenous* variables to the uptake of technology (*psychological*, *cognitive*, and *socio-demographic factors*) served as predictors to teachers' behavioural intentions to actual use of ICT in the EFL classroom. In the second, qualitative phase, case studies of the six informants explored in-depth the results from the semi-structured interviews. In this phase, the research questions addressed six internal and external factors, found to have differently contributed to the acceptance and usage of technology: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, and Behavioural Intention.

- **Contribution and Significance of the Research**

    A growing body of research studies are being conducted on teachers' use of technology by identifying the factors that support or hinder technology integration in the education sector in developed countries (e.g. Šumak & Šorgo, 2016; Kim & Lee, 2020; Shah, Khan, Khan, Khan, & Xuehe, 2020;Khan & Qudrat-ullah, 2021).However, little is known on the key determinants affecting teachers' use of ICT in the developing countries ,especially in Algeria. Hence, the research accomplished and reported in this study attempts to bridge and reduce the knowledge gap in scholarly research regarding the factors that influence teachers' acceptance and actual use of ICT at Higher Education Institutions (HEIs) in Algeria. This research identifies the significant variables that influence teachers' behavioural intentions to use ICT in the context of EFL classrooms. Thus, this research aims to offer the administrators and policymakers of HEIs with the facility to recognise the variables that influence the teachers' use of ICT and to

incorporate these influential variables into the planning, investment, and implementation phases for effective adoption and use of ICT.

To capture the ignored variables, this research extends the UTAUT model with the incorporation of the individual variable of '*attitude towards behaviour*' and '*teaching experience*' as a key moderator into the model to enhance its capacity to explain the acceptance of ICT. The suggested amalgamated model attempts to address the limitations of the original UTAUT model by integrating new constructs in the context of HEIs. The inclusion of additional variables makes it the first study of its kind applied to the UTAUT model in the arena of Higher Education Institutions (HEIs) in Algeria. This research also tries to confirm the viability of the UTAUT model in non-Western countries such as Algeria. This research adds to the body of knowledge on ICT by proposing a theoretical model that integrates attitudinal factor providing novel insights into the context of Higher Education.

In this thesis, we adopt the research instruments established and validated by Venkatesh et al. (2012) and some other scholars in the field of education (e.g., Oye, Iahad, & Ab.Rahim, 2014; Botero, Questier, Cincinnato, He, & Zhu, 2018; Zalah, 2018;Garone et al., 2019; Kim & Lee, 2020) with some modifications suitable for the Algerian context. The extended instrument offers new means for further research in the use of ICT in non-Western countries. By using the results of the research presented in this thesis, the administrators of HEIs may encourage and convince teachers and students of how easy it is to use and how useful this new technology is for them, thereby encouraging an increase in the use of the technology in their teaching and learning processes.

In terms of its practical contribution, this study may foster the development of ICT use in the Algerian Universities by conveying practical knowledge about ICT usage among teachers. Specifically, this study may make a practical contribution by:

a) Providing valuable information on the factors, which influence the acceptance and use of ICT by teachers.

b) Providing knowledge that might allow the Algerian Government (and other interested parties) to increase the uptake of ICT in classroom practices, thereby, improving workplace efficiency.

It is anticipated that this research will make valuable contributions to the body of knowledge on using Information Technology in the teaching of Foreign Languages, especially for EFL teachers. Therefore, this study is important because it will help to determine the readiness of Algerian teachers in general, and EFL teachers in particular, to use Information Technology in their teaching practices by investigating their current and actual such use for educational purposes. Moreover, the study can provide decision-makers and University administrators, as well as Governments, with valid and reliable data on the optimum means of integrating ICT into Higher Education Institutions.

This study is based on the theory and model of technology acceptance in order to predict teachers' acceptance behaviour in terms of Information Technology. The findings of this study will add to the existing body of knowledge regarding the factors related to the acceptance of ICT, by validating the use of the extended UTAUT originally developed by Venkatesh et al. (2003). The Unified Theory of Acceptance and Use of Technology (UTAUT) was tailored to specify the factors related to the acceptance of technologies in business organisations. What is original in the current study is the application of the UTAUT model by considering the EFL teachers as users within an educational organisation, as well as the particular educational context of the Republic of Algeria.

Finally, moderators such as gender, age, and teaching experience are likely to have a significant impact on Algerian Higher Education EFL teachers, and that the future practice of using Information Technology in Algerian context can be informed by considering these moderators and their effects.

In clear terms, this study has the potential to contribute to technology acceptance research by empirically testing UTAUT within an educational context through the use of participants drawn from a Higher Educational Institution in the West of Algeria in Chlef.

- **Research Aims and Objectives**

The major aim of the current study is to investigate the psychological and socio-demographic factors that affect EFL teachers' behavioural intention and actual use of ICT in the Algerian Higher Education through the extended Unified Theory of Acceptance and Use of Technology.

To achieve the aim of this study, the following objectives have been identified.

1. To investigate the factors that influence EFL teachers' behavioural intention and actual use of ICT in the Algerian Higher Education through the extended Unified Theory of Acceptance and Use of Technology (UTAUT)

2. To identify the effect of socio-demographic characteristics of teachers on actual use of ICT.

3. To develop a theoretical framework for ICT acceptance in the context of Higher Education Institutions (HEIs) in Algeria.

● **Research Questions and Hypotheses**

To investigate the major determinants of ICT use by teachers in their teaching practices, three research questions and seven corresponding hypotheses, primarily driven by the Unified Theory of Acceptance and Use of Technology (UTAUT) model, are formulated with respect to the direction and strength of relationship among independent and dependent variables. Thus, the current study intends to answer the following central research question:

RQ1:

What are the psychological factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education Institutions (AHEIs) specifically at the University of Chlef?

Thus, this question devolves into a number of ensuing questions that need to be investigated, as follows:

• To what extent (if any) do independent variables (EE, PE, SI, and FC) affect teachers' Attitude Toward Using Technology at HEIs?

• To what extent (if any) do independent variables (EE, PE, SI, FC, and ATUT) affect teachers' behavioural intentions to use ICT at HEIs?

• To what extent (if any) is Behavioural Intention (BI) a predictor of Use Behaviour (UB) of ICT at HEIs?

RQ2: How do teachers' socio-demographic variables moderate the effects of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes Toward Using Technology on teachers' intention to use ICT?

RQ3: How can the revised Unified Theory of Acceptance and Use of Technology (UTAUT) model be used to better understand what Algerian Higher Education teachers perceive they need to effectively use ICT?

To be answered, these questions need a holistic or integrated theoretical framework which can guide this research. The theoretical framework will be discussed in Chapter One (Section 1.4).

Accordingly, responding to the research questions that underpinned the current study, seven hypotheses were proposed based on the extended UTAUT model:

Hypothesis 1:

There is a significant relationship between Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude towards Using Technology, Behaviour Intention and actual use of ICT among teachers.

Hypothesis 2:

There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions on the ***criterion variable: attitude towards using Technology.***

Hypothesis 3:

There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence and Attitude Towards Using Technology on the ***criterion variable: Behaviour Intention****.*

Hypothesis 4: Predictors of Actual Use of ICT

There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude towards Using Technology and Behaviour Intention on the ***criterion variable: Actual Use of ICT.***

Hypothesis 5: Gender Difference

There is no significant difference between the mean scores of male and female teachers in their:

5.1) *Performance Expectancy*

5.2) *Effort Expectancy*

5.3) *Social Influence*

5.4) *Attitude Towards Using Technology*

5.5) *Behaviour Intention*

5.6) *Actual Use of ICT*

Hypothesis 6: Age

There is no significant difference among the mean scores of teachers with respect to age and

6.1) *Performance Expectancy*

6.2) *Effort Expectancy*

6.3) *Social Influence*

6.4) *Facilitating Conditions*

6.5) *Attitude Towards Using Technology*

6.6) *Behaviour Intention*

6.7) *Actual Use of ICT*

Hypothesis 7: *Teaching Experience*

There is no significant difference among the mean scores of teachers with respect to years of teaching experience and

7.1) *Performance Expectancy*

7.2) *Effort Expectancy*

7.3) *Social Influence*

7.4) *Facilitating Conditions*

7.5) *Attitude Towards Using Technology*

7.6) *Behaviour Intention*

7.7) *Actual Use of ICT*

- **Rationale for Conducting this Research**

The conduct of the present study could be of paramount importance for the following reasons. First, to the best of my knowledge, there are no studies that have dealt with the determinants that influence University English as a Foreign Language (EFL) teachers' behavioural intention and actual use of Information and Communication Technology (ICT). Second, this study, by covering one educational region in Chlef in the West of Algeria, sheds light on the barriers to using ICT, which may help to improve the level of technology use by trying to avoid these hindering factors and to overcome the ensuing problems. Third, the study may provide a profile of the technology integration situation in Higher Education Institutions, which may benefit the evaluation of this new system in this area, and help the policy-makers in the Ministry to plan for the next step in Higher Education, paying attention to the factors mentioned in this study. Fourth, the findings of this study could be used as a diagnostic tool to determine what teachers need to enable them to use ICT more effectively in their teaching practices. The findings of the current study might generate issues warranting further detailed investigation by other researchers in some countries of the Arab World in general and in Algeria in particular.

Fourth, the major contribution of the investigation of this study, it is hoped, would lie in dealing with a new area in the Arab world, which is the teacher's philosophy and its influence on the teacher's acceptance and use of Information Technology. This area is important because teachers are now required to shift to new methods of teaching to more constructive thinking and beliefs but before we change the external environment the change should start for the internal, which means that the teachers should start to think constructively to behave so.

- **Definition of Key Terms**

A number of key words, terms and concepts are used throughout the study. The definitions below are presented for ease of interpretation. Other concepts used in this study that may need clarification are explained in more detail as the specific concepts arise.

Information and Communication Technology (ICT)

Information and Communication Technology or Technologies (ICT) is an umbrella term that covers all technologies used for the handling and communication of

information and their use, specifically in Education. For example, desktops, mobile telephony, projection technology, digital recording equipment, software applications, multimedia resources, information systems, intranet, Internet, videoconferencing, tablet, PCs, e-readers, laptops, etc., provide a great deal of opportunities, as well as challenges for education in general, particularly teaching and learning process(Lawrence & Tar, 2018; Makhlouf, 2017; Shah et al., 2020).Hence, there is no universally agreed-upon definition of ICT because the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis (Benghalem, 2015; Yusuf et al., 2013). In the existing literature, many terms are used to discuss technology use in educational contexts such as, among others, '*IT*', '*ICT*', '*New Technologies*', '*Digital Technologies*', and '*Educational Technology*'. In the present research, the above terms are often used synonymously and interchangeably.

Performance Expectancy (PE)

Performance Expectancy is defined as the extent to which people trust that employing certain technology will help them improve their academic performance (Al Shehri et al., 2022). It is the strongest predictor of acceptance and use of several applications in both voluntary and mandatory settings (Venkatesh, Morris, Davis & Davis, 2003). In the context of this study, it represents the degree to which University EFL teachers believe that using ICT will enable them to perform teaching activities much better than before. Strengthening this belief will increase teachers' acceptance and use of ICT.

Effort Expectancy (EE)

Effort Expectancy is the degree of ease associated with the use of the system (Venkatesh et al., 2003) and the extent to which a person believes that the use of the technology will be free of effort (Yadav, Sharma & Tarhini, 2016). When a technology is perceived to be easy to use, users intend to use and continue using it (Xu, Lin & Chan, 2012). In this study, effort expectancy represents teachers' belief that using ICT will be easy and effortless. It is expected that acceptance and continual use of ICT will depend on whether teachers perceive the ICT as easy to use and free of effort.

Social Influence (SI)

Social Influence is the extent to which users perceive that important others (e.g. family and friends) believe they should use a particular technology (Venkatesh et al., 2003). In the context of this study, it represents the degree to which teachers perceive that others believe they should use ICT. According to social influence theory, users tend to comply with other important referees' opinions (Bagozzi & Lee, 2002). Therefore, when people who are important to the teacher (such as administrators, colleagues) recommend the use of ICT in teaching practices, he or she is more likely to follow their suggestions.

Facilitating Conditions (FC)

Facilitating Conditions (FC) is defined as the degree to which users believe that an organisational and technical infrastructure exists to support the use of a certain technology (Venkatesh et al., 2003). Facilitating conditions is considered as one of the environmental factors that affect users' perception of how easy or difficult it is to perform a task (Tarhini et al., 2017; Wong, 2016). In the context of this study, it refers to teachers' perceptions of the availability of resources and support to use educational technology. For instance, these resources include the availability of computers, reliable Internet connection, and perceived technical support available for assistance in case of problems and difficulties. In the context of workplace technology use, FCs are also believed to include the availability of training and provision of support (Teo & Noyes, 2014). Hence, teachers' decision to accept and then continue using ICT will be influenced by his or her perception of the availability of these resources and support.

Attitude Toward Using Technology (ATUT)

Attitude toward Using Technology (ATUT) is an individual's overall affective reaction to using a system (Šumak & Šorgo, 2016). In this study, ATUT stands for an individual's liking, enjoyment, joy and pleasure associated with technology use. Hence, many scholars introduced the construct of 'attitude toward behaviour' as one of the critical factors in the attitude theories that influence individual's intention to perform a given behaviour (eg., Ajzen, 2006; Davis, Bagozzi & Warshaw, 1989; Wixom & Todd, 2005). Given that we expect strong relationships in UTAUT between performance expectancy

and intention, and between effort expectancy and intention, we believe that, consistent with the logic developed here, attitude toward using technology will have a direct or interactive influence on intention. In this regard, it is very important to include 'Attitude Toward Using Technology' as one of the endogenous constructs in the modified research model.

Behavioural Intention to Use (BI)

Davis in Venkatesh et al. (2003) defined behavioural intention (BI) as 'the individual's readiness to perform a specific action or behaviour'. This implies that, the higher the behavioural intention to accomplish a certain behaviour is, the more likely such act will occur (Ajzen 1991).

An example of behavioural intention construct within an institution is when a teacher uses a teaching technique. As his/her experience increases, routine behaviour becomes automatic and is guided more by the associated cues (Jasperson et al. 2005). Consistent with extant theories and models of technology acceptance, behavioural intention in the current study is expected to have a positive influence on actual usage of ICT.

Acceptance of Technology

Acceptance of technology, rooted in the business context, refers to an individual's demonstrable willingness to use a technology for which it was designed (Teo, 2014). It is an attitude toward technology influenced by the social, legal, cultural, political and organisational context in which the technology is implemented, and by the amount and type of exposure the user has had to the technology (Regan, Horberry, & Stevens, 2014). Acceptance of a technology refers to an individual's willingness to use a technology for facilitating task performance based on the support it was designed to provide (Teo, 2014). In the case of teachers' technology acceptance, it is not related to whether teachers will actually use the technology in teaching, but instead whether they will accept or actively oppose the introduction or implementation of the technology (Wong, 2016). The acceptance of technology has been well studied and applied to various types of information systems such as online shopping and payment (Al Bataienh & Alafeef, 2018; Sbaa & Benyakoub, 2020), E-Banking Services (AbuShanab & Pearson, 2007; Nasri & Charfeddine, 2012), and Web Based Systems (Dahri, Vighio & Dahri, 2019; Raza & Qazi, 2020; Yeou, 2016). Hence, the present study focuses on the acceptance of

technology by teachers, defined as their *behavioural intention to use technology* in their teaching practices.

Actual Use of ICT

The actual use of ICT in classroom can be defined and determined in different ways. Actual Use of ICT is defined in the present study to refer to University teachers' use of ICT for various purposes. According to Inan & Lowther (2010) teacher's professional use of technology generally involves preparation for various classroom activities; such as preparing instructional material, communicating or collaborating with peers, students and their parents, locating digital resources, and creating lesson plans. ICT use refers to teachers' use of specific ICT applications in teaching (Wu et al., 2020). In terms of teacher ICT-related factors, ICT use was delineated into two categories: supportive ICT use , and classroom ICT use (van Braak et al., 2004). The former refers to the use of ICT for proactive and administrative teaching tasks such as teaching preparation. The latter refers to the use of ICT in the actual teaching and learning process (G. K. W. Wong, 2016). ICT use is an important factor at the teacher level. This study addresses teachers' actual use of ICT in relation to the Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology and Behavioural Intention. Therefore, in the present study, the actual use of ICT by the teacher has three major domains: academic use, administrative use and personal use. 'Technology use' and 'ICT use' are used as interchangeable concepts.

● **Organisation of the Thesis**

To meet the objective of advancing the use and appreciation of ICT in teaching practices in the context of the Algerian Higher Education Institutions, this thesis is divided into two major parts: the theoretical part and the empirical one. The first two chapters of the first part are devoted to the theoretical foundations of the current research. Chapter one reviews and synthesises the literature with respect to the definition and history of ICT in education, clarification of the concept of technology acceptance. Some salient theories and models of ICT acceptance are discussed. It also tries to build a theoretical framework in order to guide the research study in the processes of data collection, analysis and interpretation. It concludes with an in-depth review of the

factors that drive or inhibit EFL teachers towards the use of ICT. Chapter two highlights the promotion and use of ICT in the developing countries, North Africa and the Middle East (MENA) region as well as in the Arab world just to present a wider view of the issue. It provides an outline of the Algerian context for ICT implementation at the level of Higher Education. The purpose of this chapter will be to familiarise the reader with the context in which the participant-teacher work, and hence to build a conceptual picture of the background surrounding the data and the findings.

As concerns the practical part, Chapter three, four and five form the empirical grounding framework of the study. In the third chapter, a detailed description of the research methodology used to answer the research questions and test hypotheses is presented. The analyses of the quantitative and qualitative data are presented in Part 1 and Part 2 of Chapter 4, respectively. The final Chapter, Chapter 5, presents an in-depth discussion the major findings of the investigation. The data collected and examined will serve to test the research hypotheses gathered from the quantitative questionnaire in the first phase and to answer the research questions drawn from the qualitative interviews in the second phase. This chapter also discusses the integrated findings derived from both quantitative and qualitative phases.

Finally, the concluding part of the thesis is the general conclusion. This part provides a summary of the conclusions and contributions to the field of ICT acceptance and use studies, in general, and Algerian research field, in particular. It also includes a consideration of limitations of the study and recommendations for further research to open up the field to more research avenues and scopes.

Section One: Theoretical Considerations for the Current Study

CHAPTER ONE
THEORETICAL BACKGROUND
OF THE STUDY

Introduction

Thanks to the advancement of Information and Communication Technology (ICT), many countries have incorporated more technological tools in their educational system. Research has suggested that using ICT in classroom practice enables students to take a more active role in their learning rather than just play their more traditional role of a passive observer and listener (Saleh, 2008; Steel & Hudson, 2001). Algeria is one of those countries in which the Government is investing a great deal of resources to bring ICT into the Higher Education Institutions (HEIs). However, changes in classroom practices will not occur simply because computers are more available in the classrooms (Ertmer, Paul, Molly, Eva & Denise, 1999). Providing money for technology is only one step in the process. Teachers play important roles in ICT implementation initiatives in schools and Higher Education Institutions as they are the key stakeholders in an education system. Hence, teachers must adopt and use the ICT effectively for it to show benefits in terms of economic performance and student attainment (Bransford, Brown & Cocking, 2002).

Therefore, finding out the determinants that influence teachers' acceptance and use of ICT into their classrooms is becoming more and more important. The current study focused on the Algerian EFL Teachers working at Hassiba Benbouali University of Chlef during the two Academic Years 2020–2021 and 2021-2022. The present study aims at investigating the factors that might contribute to teachers' acceptance and use of ICT in classroom teaching practices identifying common underlying psychological and socio-demographic factors, which could be used to enhance the probable use of Algerian teachers of ICT in their EFL classrooms.

Chapter One builds a theoretical foundation for the research through a thorough review of the existing literature on the topic of this research. This chapter traces and discusses relevant literature in the area of the factors that influence the teacher's use of ICT in teaching practices. Hence, this chapter is divided into four main sections: the first deals with ICT in Education, which assists in a better understanding of the definition of ICT and the concept of technology acceptance underpinning this current study, and it also clarifies the evolving terminology of ICT in education throughout history; the second presents theories and models of ICT acceptance and use; the third section covers the theoretical

framework upon which the study was founded on; and the fourth and final section discuss relevant literature that explains the main factors that may contribute or impede teachers from the acceptance and use of ICT in their teaching practices.

1.1. ICT in Education

Information and Communication Technology (ICT) have increasingly been integrated into all facets of life and society. Various organisations and businesses have seen major growth due to the rapid advancement of ICT (Zhang & Aikman, 2007). The field of Higher Education has also encountered unprecedented changes due to the introduction of ICT. From the time computers first appeared in classrooms in the early 1980s, educators discovered an indispensable tool for teaching students. According to Bransford et al. (2002), ICT will continue to play an important role in educational settings for generations to come. There are numerous alternatives for using technology to support learning and teaching.

1.1.1. Definition of ICT in Education

Information and Communication Technology refers in principle to all technologies used for processing information and communication. The challenge of defining ICT, in a universal sense, becomes obvious when one considers that diverse applications of the term ICT exist within several contexts and treatments of the term. The continuum of definitions and applications of ICT one may encounter are further divided as the span of differences is represented in kinds rather than merely by degrees. Although the term ICT is found within a variety of contexts in many countries, there has been an underdeveloped response to the development of a framework for classifications representing empirical definitions and applications of the term (Zuppo, 2012). Hence, there is no globally accepted definition of ICT. This is due to the fact that technology is rapidly changing in nature. In other words, the scope of ICT is continuously changing with the creation of new technologies. For example, as stated by Anderson (2008), the term 'technology' at one time was used to describe only hardware, now 'technology' refers to hardware and software as well.

The acronym ICT can be seen as an evolution from two previously unrelated concepts, 'Information Technology' and 'Communication Technology.' Information Technology (IT) deals with the equipment such as personal computers, scanners and digital cameras

and software elements that allow individuals to 'access, retrieve, store, organise, manipulate and present information by electronic means' (Zhao, Lei and Conway, 2006, p. 685). While Communication Technology (CT) is the term used to describe technologies that can access or receive information, these include phones, faxes, modems, and computers (Zhao et al., 2006). ICT is then the consequence of the convergence of Information Technology and Communication Technology. An example of this convergence is the crossing of mobile phones and computers that led to the advent of smartphones as the most rapidly growing tool of ICT (Gholami, 2006).In this respect , Zuppo (2012) states that :

> *The acronym ICT (or ICTs) is used differently in education including benchmarks of digital literacy, economic sector definitions and regulations, information technology disciplines, socioeconomic development, and governance. The span of definitions within each type of application across the globe can vary widely. However, the primary definition of Information and Communication Technologies revolves around the devices and infrastructure that facilitate the transfer of information through digital means (Zuppo, 2012, p. 13).*

According to Nandwani and Khan (2016), ICT is a set of various technical resources and tools, which are basically used to produce, interact, spread, manage, and store information. These technologies include Internet and computer broadcasting technologies such as television, radio, wireless communication, and telephones (Shah, Khan, Khan, Khan & Xuehe, 2020). For the purpose of this research study, ICT is defined as the use of computers and other electronic equipment and systems to collect, store, use, and send data electronically. Hence, ICT is an umbrella term that includes any communication device or application encompassing cellular phones, computer and network hardware and software, as well as various services and applications associated with them, such as the Internet and video conferencing. These can be used to enhance and support distance learning (Cirera, Lage & Sabetti, 2016; Renukadevi, Rajarajan, Vedanayagi & Raja, 2018). Therefore, in most educational circles, ICT is considered to be the application of digital equipments to all aspects of teaching and learning, which encompasses (PC, TV, radio, cellular phones, laptops, overhead projectors, slide projectors, power-point projectors, electronic boards, the Internet, hardware, software, and any technology specific to your teaching area).

The use of ICT has brought about rapid transformation which involves the use of computers, Internet and other information technologies (Jimoh, 2007). However, other

researchers and scholars viewed ICT as electronic or computerised devices which enabled us to process and share information. This semantic diversity derives from the rapidly evolving integration of computers with communications, video, and audio technologies, where the separate technologies become nearly indistinguishable (Anderson, 2008).

The use of ICT in teaching referred in this study involves teachers' use of the computer, Internet and other related IT that allows the dissemination of information and knowledge through intra-and extra-connected computers, as well as educational software for the purposes of teaching and learning. Therefore, within the context of the current study, the term Information and Communication Technology is used both in its singular form 'ICT' meaning 'the process or outcome' and in its plural form (ICTs) meaning 'specific devices or processes' as suggested by some researchers. The terms 'technology', 'Educational Technology', 'Computer Technology', and 'Information Technology (IT)' are used interchangeably with ICT in the current study.

1.1.2. The Historical Evolution of ICT in Education

Since the introduction of the computer into Education in the 1960s, its potential for Primary, Secondary Education has been recognised by many researchers, policy-makers and practitioners themselves. The development of Computer Technology from processing information to also supporting communication augmented its potential for Higher Education. Owing to the enormous impact of these technologies, our society is in transition toward an '*Information or Knowledge Society*' (Anderson, 2008). Thus, the issue of 'Computers in Education' started to become popular in educational policy-making in the early 1980s, when relatively cheap microcomputers became available for the consumer market (Pelgrum & Law, 2003). Stimulated by governmental policies, and quite often led by the fear of losing the technology race, many countries started to build their own brand of microcomputers and distributed these to schools in particular.

Pelgrum and Law (2003) further observed in their entitled book "*ICT in education around the world: Trends, problems and prospects*" that toward the end of the 1980s, the term Computer Technology has been replaced by Information Technology (IT) or Technology in North America signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the

term Information and Communication Technology (ICT) around 1992 mostly used in Europe when email started to become available to the general public. In the same vein, Lloyd (2005, p. 3) traced the history of how the term ICT was coined. She found that its 'antecedent' term was IT, which was more focused on technological use in Government Administration, Education and such other areas as 'programming, database design and expert systems'. ICT refers to all technologies used for processing information and communicating. Because of the integration of computers with communication systems, including audio and video technology, also terms such as multimedia or digital media are being used. Due to the fast pace of developments in ICT, the meaning of this term is constantly evolving. For instance, Toomey (2001) defines ICT as follows:

> *Technologies that are used for accessing, gathering, manipulating and presenting or communicating information. ICT could include software, hardware, connectivity (e.g. access to the Internet, local networking infrastructure, and video conferencing). What is most significant about ICT is the increasing convergence of computer-based, multimedia and communications technologies and the rapid rate of change that characterises both the technologies and their use (Toomey, 2001, p. 1).*

When discussing the history of the implementation ICT in Education, educators and researchers tend to divide it into a number of periods of time. According to Roblyer and Doering (2014), the development of ICT in schools could be divided into three eras: the pre-microcomputer era, microcomputer era, and Internet era. Therefore, looking back at ICT history one can clearly notice that the main attention of researchers and technologists has gradually moved from hardware to software, next – to human – computer interaction, and recently – to social issues related to global communication and collaboration (Nikolov, 2001). In fact, the process of integrating technology in education has been ongoing for the past two decades**.**

Besides, the term 'technology' was used in the learning and teaching and English Language Teaching (ELT) literature long before the term 'ICT' came into being. Various technologies have been used in the ELT classroom from phonographs and radio in the 1930s through television in the 1950s and 1960s, to VHS cassettes in the 1970s and 1980s, DVDs in the 1980s and 1990s, and finally computers and the Internet in the late 1990s and 2000s, various technologies have been employed in the ELT classroom (Bonk, 2015).

In Higher Education, the term *technology* covers a wide range of connotative meaning and is not simply understood as just the tools, 'computer or peripheral devices'(Lloyd,

2005, p. 3) available for the sake of learning and teaching. In the field of ELT, Computer Assisted Language Learning (CALL) was also a commonly employed term before the use of ICT was used to refer to artefacts, practices and contexts related to computers and online learning. A number of studies were undertaken to explore the efficacy of CALL in ELT (e.g. Kettemann, 1995; Timuçin, 2006; Widdowson, 1992). However, these mainly focused on static computers used in the actual classroom rather than all technology related to learning and teaching. In the ELT classroom context, Inan and Lowther (2010) highlight that the term ICT can therefore be classified in terms of 'instructional preparation', 'instructional delivery' and 'learning tools' and refers to all of the following:

- Hardware and software
- Computer Assisted Language Learning (CALL)
- Mobile Assisted Language Learning (MALL)
- Cloud computing
- Computer-based learning, technology-based teaching
- Open source technologies (Inan & Lowther, 2010, p. 138)

The way in which ICT is used in the Higher Education ELT classroom has also evolved and continues to evolve. Early use of ICT is defined in the literature as Education 1.0 since it mainly focuses on using ICT to learn languages and other skills (Harkins, 2008). This was swiftly replaced by Education 2.0 or 'Internet-enabled learning', where the teacher remained central, but performed as a mentor and guide assisting students to use Web resources such as Social Media and to interact with each other within the class and/or institution. More recently, however, there has been a movement toward Education 3.0. According to Keats and Schmidt (2007),

> *Education 3.0 is characterised by rich, cross-institutional, cross-cultural educational opportunities within which the learners themselves play a key role as creators of shared knowledge artefacts, and where social networking and social benefits outside the immediate scope of activity play a strong role* (Keats & Schmidt, 2007, p. 3).

In this environment with Education 3.0, learning outside the classroom becomes as important as inside and a wide range of resources including Massive Open Online Courses (MOOCs) are used. As noted by Bonk (2015, p. 8), students have more choice and are not 'confined to one place, one path, one way', but instead have a choice in the learning process and learning can take place 'everywhere' and is 'thoroughly infused into society' (Harkins,

2008, p. 8). The role of the University teacher also transforms into that of a 'curator' or 'learning ambassador', 'who finds and collects ideas, connections and resources to share with students, guiding them along the path of their own development' in a way that is 'personally meaningful to them'. In Education 3.0, learning is also viewed as enabling students' (co) construction of new knowledge (Bonk & Zhang, 2008). Some have even started referring to Education 4.0, implying that students move from (co) constructors of knowledge to producers of 'innovation' and that schools and Universities are now located in 'the globally networked human body, a continuously evolving instrument'(Harkins, 2008; Marginson, 2016). In the same vein, Voogt and Knezek (2008) highlight that:

> *The rather confusing terminology is partly due to rapid technological changes. By the twenty-first century, Computer Technology has become mobile, personal and networked; standalone desktop PCs are being replaced by laptops, personal digital assistants or mobile phones. These developments also triggered the evolution of new terms, to indicate the use of computers – or more generally Information Technology (IT) – in education (Joke Voogt & Knezek, 2008).*

More recently, new terms evolved to indicate computer use in education, such as E-learning (electronic learning), M-learning (mobile learning), Web-based education or learning, multimedia learning and ubiquitous learning. The term E-learning is used for learning that is facilitated or delivered through the use of computer or communications technologies, the Internet, CD-ROM and/or television. Similar to E-learning, the term M-learning emphasises the facilitation of learning through the use of mobile computer technology, such as mobile phones, personal digital assistants and laptops. Also, the term multimedia learning is often used when a mix of audio and video technologies is integrated in the learning environment. The most recent term that is emerging for computer use in education is ubiquitous learning that comes from ubiquitous computing, the ever presence of computer technology in the environment. Ubiquitous learning refers to the potential of computer technology to make learning possible at any time and at any place. These more recent terms refer to broader conceptualisations of computer uses in education.

This evolving use of ICT for learning and teaching places additional pressures on teachers. They are not only expected to increasingly use ICTs, including digital devices and mobile technologies, into their teaching within the classroom and communicate online with students outside of the classroom, but also to radically reform the way they interact into an entirely student-centred pedagogy that promotes autonomous learning and even

innovation (Hu & McGrath, 2011). To be brief, the very terminology of technology and, in education, the use of the phrase *Information and Communication Technology* reflect the symbiotic nature of technology and education for learning (Jones & McLean, 2018). The adoption of new technology plays a significant role in shaping the future of the educational sector of any country. Thus, it is of utmost importance to understand first the concept of ICT Acceptance and its use in the field of Education.

1.1.3. Defining the Concept of Technology Acceptance

Research on individual acceptance and use of Information Technology (IT) is one of the most established and mature streams of information systems (IS) research (see Venkatesh et al., 2007; Venkatesh et al., 2012). Researchers have proposed and tested several competing theoretical models (e.g. the Technology Acceptance Model or (TAM); Theory of Planned Behaviour (TPB), primarily developed from theories in psychology and sociology – for a review, see Venkatesh et al., 2003) in a bid to explain and predict user acceptance and use of IT across a variety of settings. The basic aim of technology acceptance research is to distinguish the factors which will influence a person's acceptance (or rejection) of a technology. This pursuit of knowledge has yielded many different models.

The origins of technology acceptance research have often been credited to the fields of business and information sciences (Stockman, 2017) given the close relationship between the appropriate uses of technology and profit margin (Teo, 2011). Over the years, scholars from diverse disciplines have given their attention to, albeit overdue, examining the role of technology acceptance in other contexts (Stockman, 2017). In this regard, Stockman is commended for contextualising technology acceptance in cultural studies, an attempt hitherto unparalleled in the literature.

According to the Rogers' definition (1971), 'acceptance' is a process during which, based on his/her primary knowledge, an individual or other decision makers develops an attitude toward innovation and intention to adopt that innovation and insists on this decision (Keramati, Sharif, Azad & Soofifard, 2012). There are studies defining acceptance as '*the behavioural intention to use an information technology*,' studies defining acceptance as '*the actual use of an information technology*,' and studies measuring both behavioural intention and actual use in regard to the two dependent variables of

Technology Acceptance Models'*the behavioural intention to use an information system* 'and 'the actual use'. In the same vein, Venkatesh, Morris, Davis and Davis (2003) also concluded that user's acceptance of new technology is dependent on 'the behavioural intention' and 'actual use' of technology. The question 'what is technology' really isn't as straightforward as it may sound, let alone 'technology acceptance' or some of the other key concepts in research, like 'usefulness'(Stockman, 2017). The term technology acceptance deals with the agreement and continuous use of Information Technology as well as with the user's willingness to employ technology for the tasks it is designed to support (Botero, Questier, Cincinnato, He & Zhu, 2018). It has been well studied and applied to various types of information systems such as online/mobile banking (e.g. Al-qeisi, Dennis, Hegazy & Abbad, 2015; Al-Qeisi, 2009; Bhatiasevi, 2016; Ghalandari, 2012; Jouda, 2020; Sok Foon & Chan Yin Fah, 2011), e-commerce adoption (Sutanonpaiboon & Pearson, 2006), and e-learning acceptance and use (Al-gahtani, 2016; Bellaaj, Zekri, & Albugami, 2015; El-Masri & Tarhini, 2017 ; Jaber, 2016; Kocaleva, Stojanovic, & Zdravev, 2015 ; Tarhini, Masa'deh, Al-Busaidi, Ashraf Bany, & Maqableh, 2017; Yakubu & Dasuki, 2019; Zalah, 2016, 2018). In educational contexts, for example, technology cannot fulfil its promise in terms of capabilities if the user does not actually make use of it (Teo, 2011).

User acceptance of technology may be described as a person's psychological condition regarding his/her intention to use a technology (Dillon & Morris, 1996 as cited in Khan & Qudrat-Ullah, 2021). Technology Acceptance can be described as acceptance ranging from active opposition to consent and commitment to technology. Technology acceptance is an attitude toward technology influenced by various factors. In the case of teachers' technology acceptance, it is not related to whether teachers will actually use the technology in teaching practices, but instead whether they will accept or actively oppose the introduction or implementation of the technology. Thus, the term 'technology acceptance' is not univocal (Stockman, 2017, p. 93). Fred Davis (1989) measured it in terms of frequency. The more acceptant a person is of technology, the more he or she will use it. Hence, to explore if a person is 'technology acceptant', we need to know what that means for that person in that context (Stockman, 2017). According to Stockman, technology acceptance was found to have five dimensions: frequency of use, variety of

technologies/functions used, nature of use, extent in teaching, and perceived level of competence. The present study focuses on the acceptance of technology by teachers, defined as their behavioural intention to use technology in their teaching practices.

- Arguably, a consensus definition of what is meant exactly by the term 'acceptance' cannot emerge until there is a much clearer view (supported by evidence) of the relationship between acceptance and related constructs such as usefulness, usability, trust in the technology, pleasure in use, satisfaction, desirability, impact on others, social status conferred by use, and so on (Regan, Horbury & Stevens, 2014). It might also be important to better recognise different types of acceptance, for example, attitudinal acceptance, behavioural acceptance, conditional/contextual acceptance and social acceptance. Hence, the lack of a single unifying theory and definition of acceptance has been mirrored by a large number of different attempts to develop models of acceptance, and a number have been reviewed (Venkatesh et al., 2003) and used as starting points in several empirical studies in the literature, principal among these being the Theory of Planned Behaviour (TPB) based on the Theory of Reasoned Action;
- the Technology Acceptance Model (TAM); and
- the Unified Theory of Acceptance and Use of Technology (UTAUT).

The technology acceptance domain is a well-researched area in the Information Systems and Information Technology areas. Several models and theories exist that try to predict an individual's intention to adopt or not adopt a specific technology (AbuShanab & Pearson, 2007). This research has typically concentrated on 'usage' or 'intention to use' as the key dependent variable. Research in this area has explored topics such as the adoption of electronic commerce (Henderson & Divett, 2003). Research in the area of technology acceptance generally has lacked the integrated view needed to understand the domain. The work proposed by Venkatesh et al. (2003) integrates previous technology acceptance models into a Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT hypothesised four main indicators (Effort Expectancy, Performance Expectancy, Social Influence, and Facilitating Conditions) as influencing behavioural

intention and/or use behaviour. These relationships were suggested to be moderated by age, gender, experience and voluntariness.

A plethora of research studies have found all these models of acceptance are lacking or insufficient in some regard. So, although scholars do not have a single agreed definition, or a single model, of acceptance, there seems to be a general consensus on some important issues:

- acceptance is a complex construct which has many facets and dependencies;
- acceptance is based on individual judgements, so a teacher-centric view is required to measure or predict acceptance at an individual level (assessing societal acceptance requires an additional broader perspective);
- two key determinants of acceptance of new technology are: usefulness (Performance Expectancy) and ease of use (Effort Expectancy);
- acceptance depends on the individual, so issues such as gender, age, and experience are likely to be important;
- the context of use is also important, including the supporting 'infrastructure' (in its widest sense), whether use of the technology is voluntary and also broader social/cultural effects;
- teachers do not have to actually like a technology/system to accept it (but liking it may increase use of the technology);
- acceptance should be viewed as a continuous variable rather than a dichotomous idea; and
- acceptance is not invariant; it may change (even for one individual) depending on the specific time/context in which the new technology is used and as experience with the technology develops.

To increase the acceptance level of students, educators and administrators, technology systems have to define a broad variety of students' purpose, intentions, and preference for the usage of Information Technology systems and should acquire the ability to incorporate these factors into the processes of improvement (Tarhini, Hone & Liu, 2013). Acceptance behaviour among potential users remains decisive for the use of ICT. In different contexts and populations, the Technology Acceptance Model (TAM) with its extended model, namely, Unified Theory of Acceptance and Use of Technology (UTAUT) have been

extensively used to examine the intent of users to make decisions about implementing technology systems, and the UTAUT may be of use in predicting the acceptance and then the use of ICT by users.

Teachers must be equipped with a variety of abilities as well as an understanding of the implications of employing technology in order to improve students' learning experiences. They must be able to create online courses that encourage students to participate in educational processes while also maintaining their enthusiasm and developing their learning skills (Lee et al., 2013). The Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) are probably the most cited theories by researchers in the technology acceptance domain (Yakubu & Dasuki, 2019). UTAUT identifies four key factors (i.e. Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)), and four moderators (i.e. age, gender, experience, and voluntariness) related to predicting behavioural intention to use a technology and actual technology use (Venkatesh et al., 2016). To the best of my knowledge, the current study is probably one of the first to use the UTAUT model to the technology acceptance domain in a non-Western culture at the level of the Algerian Higher Education Institutions (AHEIs) by EFL teachers.

According to Šumak et al. (2011), the rapid advancement of technology in all areas in recent years means that its acceptance and use by organisations and individuals has become an important factor when judging whether it can be successfully applied within any enterprise. This needs to be properly understood from the outset, as acceptance by the target group can influence later use (Davis, Bagozzi & Warshaw, 1992) and is the main criterion for its success and for increasing demand (Park, 2009). Hence, understanding the determinants that influence the acceptance of ICT by users is of paramount importance in making decision toward the implementation and use of ICT. However, this is not an easy task; in fact, one of the most challenging research questions in the era of Information Technology is to understand why individuals choose to accept or reject new technologies (Henderson & Divett, 2003).

The concept of ICT acceptance and use in education provides a fundamental theoretical basis for research and practice in teaching and learning process. Pachler and Turvey (2018) in a critical review of the various historical analyses of the impact of technological

interventions in education define the term 'educational technology' as the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources. The 21st century classroom is networked, adequately provided with a rich Internet connection to support media streams, personal Skype and group/video conferencing communications. It is able to upload and download students work and research to suitable structures to support 'anywhere anytime' learning and collaboration. Given the proliferation of ICT services for the mass market, there is a pressing need to understand why individuals choose to accept or reject new technologies.

To conclude this section on the clarification of the notion of ICT acceptance in regard to the different models and theories, we can say that a simple definition of teacher acceptance is elusive, and that consensus for a more complete definition is currently missing. Not unconnected with this, the situation concerning modelling of acceptance is similar: there are a number of proposed technology acceptance models, but consensus is lacking. It is also worth noting that many of these theories and models were developed originally for non-teaching contexts. Nevertheless, seeking a better understanding of the determinants of teacher acceptance appears worthwhile, as it is likely to support syllabus designers of contents incorporating new technology as well as decision makers in developing implementation strategies to support desirable educational goals such as increased quality of teaching and learning.

Having discussed the Concept of Technology Acceptance, it may be useful to review the theories and models of the acceptance and use of Information Technology.

1.2. Theories and Models of Technology Acceptance

Advances in Information and Communication Technology in terms of hardware (such as computers, interactive whiteboards, digital cameras, projectors, scanners, etc.), software (such as Word Processor Programs), and communication networks (such as the Internet and Email) provide the opportunity for accessing information 'anytime' and 'anywhere' in the globe just with few clicks on the keystrokes and mouse. Technology acceptance refers to end users' willingness to use available technology to carry out the tasks assigned effectively and efficiently.

The acceptance of Information Technologies is identified as the willingness of the end users, namely, teachers, to use the available technology to carry out the educational tasks effectively and efficiently. Recently, the researchers on technology acceptance have become much concerned to understand the factors affecting the adoption of technologies in different settings. The issues of technology acceptance have occupied a fundamental location in the literature about educational technology. This is mostly because of the developing interest in incorporating technology into classroom settings to promote learning in addition to improving the problem-solving skills of students.

Much of the conducted research in technology acceptance and use is based on theories and models from Behavioural and Information Sciences. However, there are a plethora of models and theories in the existing literature that attempt to explain the concept of technology acceptance, but the majority of them are built upon Rogers'(1983) Diffusion of Innovation Theory and the Social Cognitive Theory (proposed by Bandura, 1986).Hence, technology acceptance is explained by the end users' intention to use technology which is determined by their behavioural factors. The intention-based theories and models that are developed and empirically tested include: (a) Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), (b) Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi & Warshaw, 1989) , (c) Theory of Planned Behaviour (TPB) (Ajzen, 1991), (d) Combined Theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM) (Taylor & Todd, 1995),and (e) Extended Technology Acceptance Models (TAM 2 /TAM3)2000s (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Wixom & Todd, 2005).Therefore, most of these theories and models emphasise that the Behavioural Intention of an individual is determined by factors such as individuals' perceptions on technology, attitudes, social influences and facilitating conditions to predict intended or actual use of technology.

Despite all of these models and theories, researchers studying technology acceptance continue to encounter a challenge. That is, "when considering the introduction of new technologies, which model and constructs are best suited?" Venkatesh, Morris, Davis, & Davis (Venkatesh, Morris, Davis, & Davis, 2003). Before selecting the most suitable technology acceptance model for the research at hand, all of the models should be thoroughly understood. Hence, for a better understanding of the genesis and development

of the UTAUT, the different eight preceding models need to be reviewed and presented here.

1.2.1. Theory of Reasoned Action (TRA) 1975

The Theory of Reasoned Action (TRA), developed by Fishbein & Ajzen (1975), is a well-researched technology acceptance model from social psychology that can be used to predict behaviour in a wide variety of situations, not just the adoption of information systems technology. The TRA is one of the most fundamental and influential theories of human behaviour that defines relationships among beliefs, norms, attitudes, intentions and behaviour. The TRA states that an individual's attitude toward a behaviour and the surrounding subjective norms (whether the individual believes that people important to them think they should perform the behaviour) influence their behavioural intention. Figure 1.1 shows a schematic of the model.
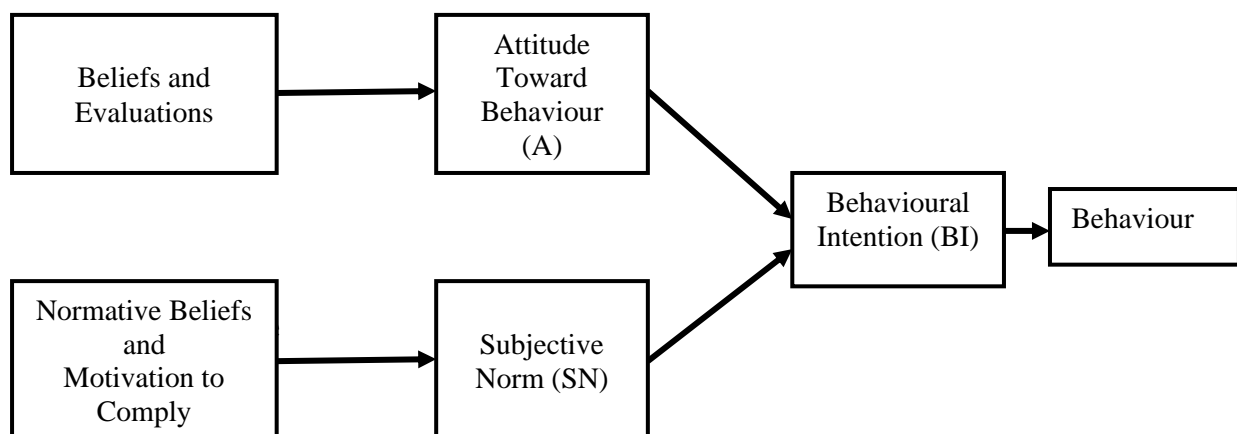
Figure 1.1 Theory of Reasoned Action (Fishbein & Ajzen, 1975)

According to TRA, an individual's performance of a specified behaviour is determined by his or her behavioural intention (BI) to perform the behaviour, and BI is jointly determined by the person's attitude (A) and subjective norm (SN) concerning the behaviour in question (Figure 1.1). This theory aims to explain the relationship between attitudes and behaviours within human action. Hence, the genesis of the Theory of Reasoned Action is attributable in large part to the assertion that the relationship of attitude (and subjective norm) to behaviour is mediated by the formation of a behavioural intention (Haddock & Maio, 2004).

Additionally, Ajzen and Fishbein (1980) claimed that individual behaviour in the Theory of Reasoned Action is rational and based on a systematic assessment of the

information available to them in a certain situation. Thus, an individual's behaviour – in the case of this study, the use or rejection of ICT – is determined by his or her intentions to perform the behaviour, and this intention is influenced jointly by the individual's 'attitudes and subjective norms'.

1.2.2. Technology Acceptance Model (TAM) 1989

The Technology Acceptance Model (TAM) proposed and developed by Davis in 1980s for his doctorate proposal. This model was derived from the Theory of Reasoned Action (TRA) to find out what factors cause people to accept or reject an Information Technology in the workplace. The model suggests that when users are presented with innovation, a number of factors influence their decision about how and when they will use it. These factors include: *Perceived Usefulness* (PU) and *Perceived Ease-Of-Use* (PEOU). PU and PEOU are fundamental in understanding the determinants of a person' attitude towards using technology. Thus, "PEOU" and "PU" are the two key independent variables that define a person's attitude toward a specific technology. In addition to the indirect effect of 'A' on 'BI,' 'PU' can have a direct effect on 'BI' (see Figure 1.2).

According to Davis (1989:320), *perceived usefulness* is 'the degree to which a person believes that using a particular system would enhance his or her job performance' while *perceived ease of use* is 'the degree to which a person believes that using a particular system would be effortless'. Hence, TAM is based on principles derived from psychology, which attempts to understand and measure the 'behaviour relevant components of attitudes' and makes possible the understanding of how external stimuli can influence the beliefs, attitudes and behaviour of the individual toward such a thing as technology.

The basic model was improvised by introducing Attitude Toward Use as a determinant of Behaviour Intention to use a technology (Davis et al., 1989). Figure1.2 provides a schematic representation of the Technology Acceptance Model. The Technology Acceptance Model is specifically tailored for modelling user acceptance of Information Technology. The goal of the model is to provide an explanation of the determinants of computer Information Technology acceptance by tracing the impact of external factors on internal beliefs, attitudes and intentions (Davis et al., 1989).
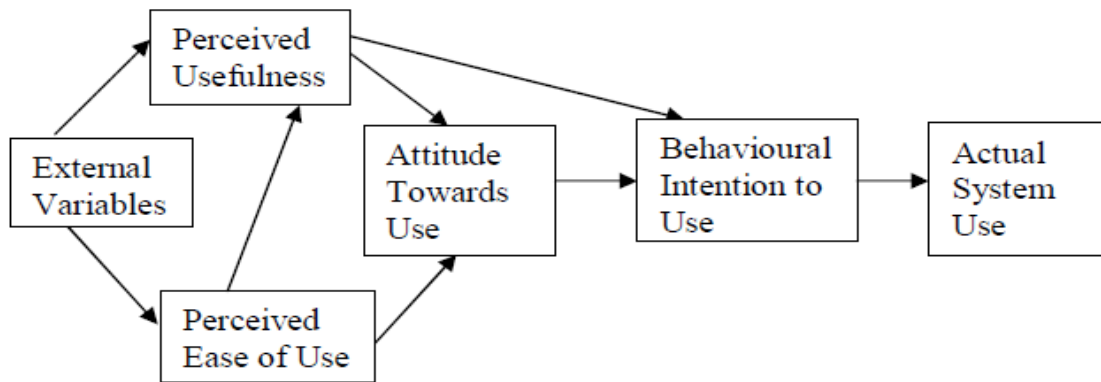
Figure 1.2 The Technology Acceptance Model (Davis, Bagozzi and Warshaw ,1989)

Davis, Bagozzi and Warshaw (1989) further developed a 'theory of action relating to reasons', technology acceptance model, based on the work of Fishbein and Ajzen, to explain why some people use computers and others do not. According to their model, shown in Figure 1.2, the *perceived usefulness* and *ease of use* of the technology will affect a person's *attitude* toward using it. In addition, TAM hypothesises that a technology that is useful and easy to use, would lead to a positive intention to use it. Furthermore, these factors are influenced by *external variables.* As with Fishbein and Ajzen's model, attitudes affect *intentions* to use ICT, which, in turn, affect *actual use.* Davis, Bagozzi and Warshaw tested this model with 107 adult users. They found that people's computer use was predicted by their intentions to use it and that perceived usefulness was also strongly linked to these intentions.

In the Information Systems field, researchers have widely used the Technology Acceptance Model to study the adoption of various technologies and TAM has arguably become the most influential theory in the IS field. TAM appears to be a useful model, but further investigations have found its shortcomings, leading to the conclusion that it is necessary to extend and adapt it with additional relevant variables and theories. Davis (1989:334), as one of the pioneers of TAM, has admitted that his model requires 'further research to shed more light on the generality of (its) findings'. As a consequence, it appears that other theories are needed to supplement the explanation of users' acceptance of technological systems in a particular educational setting. The following section will go over a well-known Theory of Planned Behavior (TPB).

1.2.3. Theory of Planned Behaviour (TPB) 1991

The Theory of Reasoned Action (TRA) had been revised and extended to the Theory of Planned Behaviour (TPB) by Ajzen (1991) to incorporate mandatory situations, as opposed to the TRA, which was intended to predict human behaviour only in real voluntary situations.TPB extended TRA by adding a third construct of Perceived Behavioural Control (PBC) to the constructs of attitudes and subjective norms which make the TRA. Perceived Behavioural Control refers to 'people's perception of the ease or difficulty of performing the behaviour of interest'. In TPB, perceived behavioural control is theorised to be an additional determinant of intention and behaviour. The rationale for introducing the Perceived Behavioural Control variable to extend the TRA to TPB, according to Armitage & Conner (2001), is to provide information about the potential restrictions on acting behaviour, as well as to explain why intentions do not always predict behaviour. Hence, the two theories of Planned Behaviour and Reason Action are similar in the assumption that individuals are rational decision makers.

According to Ajzen (2006) , attitude is the evaluation of the performance effect of a particular behaviour, subjective norms are perceptions of individuals based on other people's opinions on whether the particular behaviour should be performed and perceived behaviour control is the perceptions of individuals on the essential resources necessary for performing a behaviour. Figure 1.3 provides a schematic representation of the Theory of Planned Behaviour.
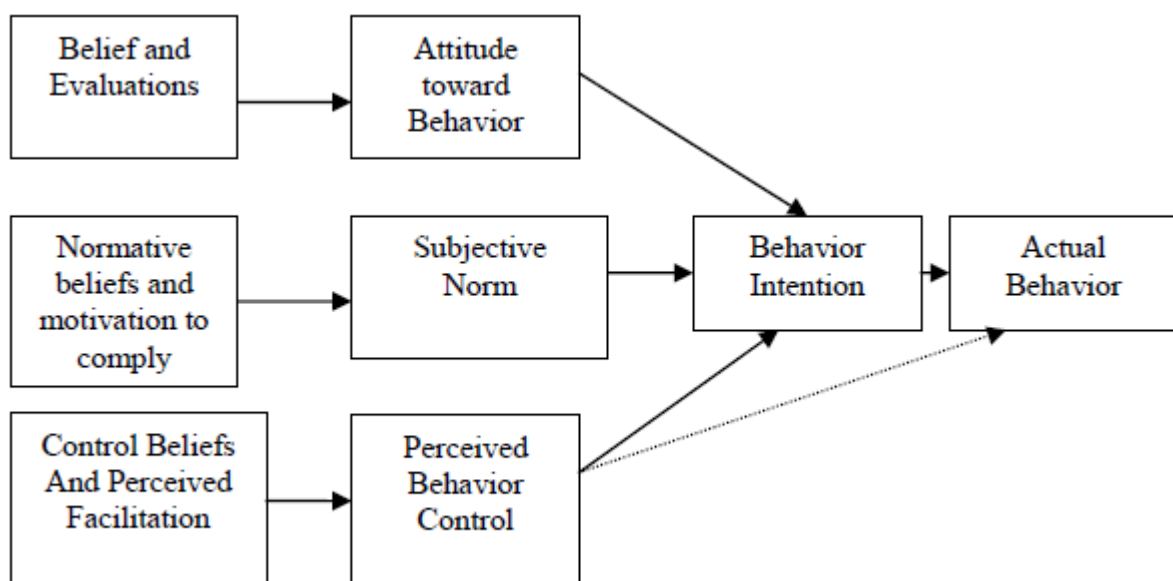
Figure 1.3 The Theory of Planned Behaviour (Ajzen, 1991)

Ajzen (1991) presented a review of several previous studies that successfully used TPB to predict intention and behaviour in a wide variety of settings. TPB has been used by many researchers and successfully applied to the understanding of individual acceptance and usage of many different technologies throughout the world. However, when TPB is applied in the context of Information Technology, the new construct in the TPB model, which is perceived behavioural control, is substituted by perceptions of internal and external behavioural constraints(Taylor & Todd, 1995). Despite the addition of PBC, the TPB model ignores other elements that influence behaviour, such as morals, perception about technology, habit, and support for using technology, many of which can help to change behaviour.

1.2.4. Diffusion of Innovations Theory (DIT) 1991

Research literature in the diffusion of innovations can be traced back to the epic work by Everett Roger's in 1990s named as the Diffusion of Innovations Theory which has been widely applied by many researchers over the years. Rogers (2015) defined diffusion as 'the process in which (1) an innovation (2) is communicated through certain channels (3) over time, (4) among the members of a social system' . Diffusion is a special type of communication concerned with the spread of messages that are perceived as new ideas, and necessarily represents a high degree of uncertainty to the individual. According to Rogers (2015), the main premise of the theory is that there are four elements that influence the spread of new ideas: (1) the innovation, (2) communication channels, (3) time, and (4) the social system. Hence, the Innovation Diffusion Theory helps to understand how an innovation is diffused and adopted by end users. The central component in the diffusion process, the innovation itself, is defined by Rogers as, 'an idea, a practice, or object that is perceived as new by an individual or other unit of adoption' (E. M. Rogers, 2015).

The innovation-decision process is the mental process through which an individual (or other decision-making unit) passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to the implementation of the new idea, and to confirmation of this decision. An individual seeks information at various stages in the innovation-decision process in order to decrease uncertainty about an innovation's expected consequences. Furthermore, the process of diffusion consists of five stages, namely, knowledge, persuasion, decision, implementation, and confirmation.

Accordingly, innovation diffusion is explained through five adopter categories on the basis of individuals' innovativeness: (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards.

The way teachers perceive Information and Communication Technology shapes their attitudes and determines the implementation of digital tools in the language classroom. Rogers (2003) claims that there are 5 characteristics of innovations that explain why certain innovations were successfully and widely adopted while others were not. The five characteristics of innovations and their implications and relevance for ICT use in the classroom include (1) 'relative advantage', (2) 'compatibility', (3) 'complexity', (4) 'triability' and (5) 'observability'. Rogers' Diffusion of Innovations Theory can be illustrated as shown in Figure 1.4.
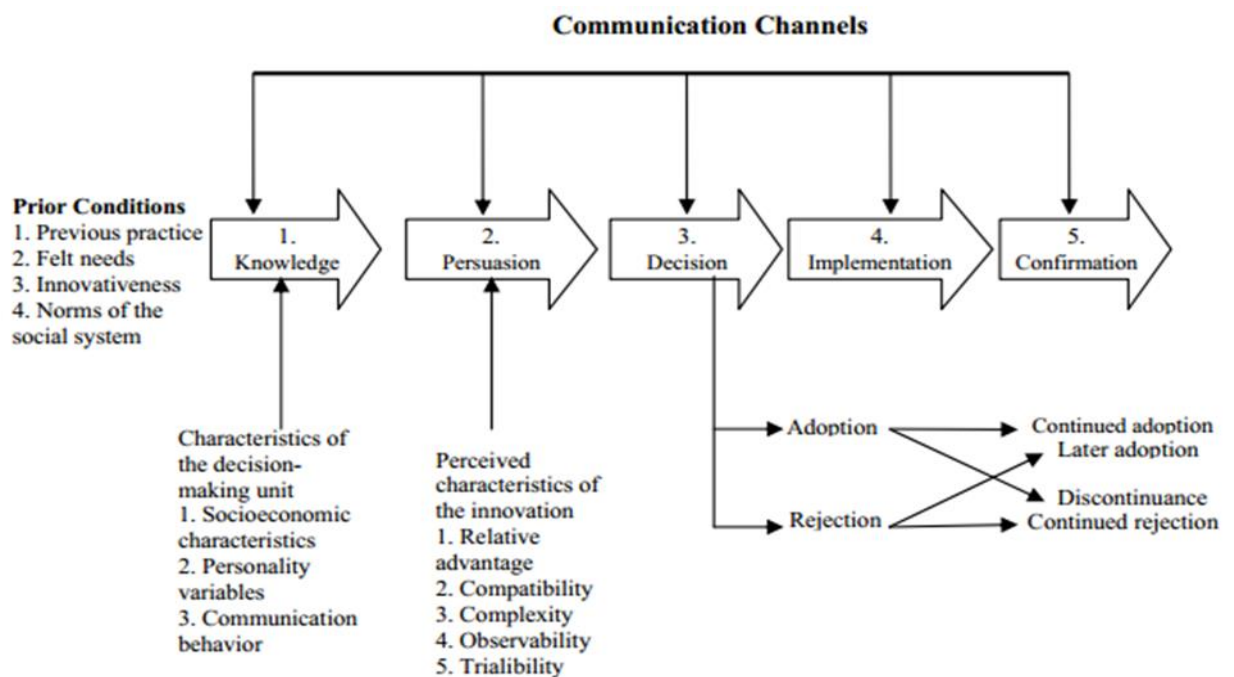
Figure 1.4 Stages of Innovation-Decision Process, Based on Rogers (2003, p. 170)

A multitude of research studies have been published investigating individual behaviour from the viewpoint of Rogers's theory on diffusion of innovation to explain the phenomena of technology diffusion in Higher Education (e.g., Allehaibi, 2001; H. Laabidi, 2017; Wario, 2014). For example, Allehaibi (2001, p. 10) used Rogers' (1995) theory on diffusion of innovation to find out which, among five perceived attributes of innovation, contributed to adoption of Internet technology in a Saudi Arabian University. Likewise,

later Jacobsen's (1998) mixed-method approach research study also used Rogers' (1995) theory on diffusion of innovation to determine the adoption patterns and characteristics of the faculty who integrate computer technology for teaching and learning in Higher Education. In a similar vein, Amil et al. (2020) examined the attitudes of Moroccan Professors of English toward the use of computers in teaching practices. Here as well, the Theory of Diffusion of Innovation (Rogers, 1995) served as the theoretical framework.

According to Azmi (2017) in his research study conducted in the Moroccan English language classroom, an overall assessment of Rogers' Diffusion of Innovations Theory and its relevance to ICT adoption in the EFL classroom shows that potential users should be aware of the advantages of the targeted innovations in the classroom and their utility and usefulness to the teaching of the language (relative advantage). Most important is the compatibility of technologies with existing practices in the classroom (*compatibility; complexity*) and ease of use and implementation (*triability*). If teachers fail to observe the advantages of the use of Information and Communication Technologies and the difference they can make in the EFL classroom, and face challenges and barriers while attempting to implement them, there is a higher probability that they would show less enthusiasm and commitment (*observability*).

Based on the aforementioned analysis and reviewing of the literature, DIT is one of the two founding theories on which all the models of technology acceptance have been built. Rogers' Diffusion of Innovations Theory provides a theoretical foundation for the presentation and evaluation of all possible factors that may determine ICT use and implementation in the foreign language classroom. Possible factors include attitudes, ICT training, availability of ICT material in the workplace as well as classroom challenges and limitations. Thus, within the context of technology implementation at Universities, one would expect that a teacher is likely to use technology if it is (a) advantageous as compared to present practices of teaching, (b) consistent with pedagogy of teaching and learning, (c) easy to use, (d) possible to try in the classroom, and (e) likely to enhance the teaching-learning process at universities.

1.2.5. Combined Theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM) 1995

Another attempt to overcome the short-comings of the TAM was made by Taylor and Todd (1995) ,who developed a hybrid model by combining the predictors of TPB with the constructs of perceived usefulness and ease of use from TAM in order to provide a more comprehensive understanding of technology adoption.

This model is also called the Decomposed Theory of Planned Behaviour (DTPB) because the belief structure is decomposed in the model. The attitude is decomposed to include perceived usefulness, perceived ease of use and compatibility. The normative belief structure includes peer influence and superior influence. The control belief structure includes self-efficacy, resource facilitating conditions and technology facilitating conditions. Figure 1.5 shows a drawing of the C-TPB-TAM model.
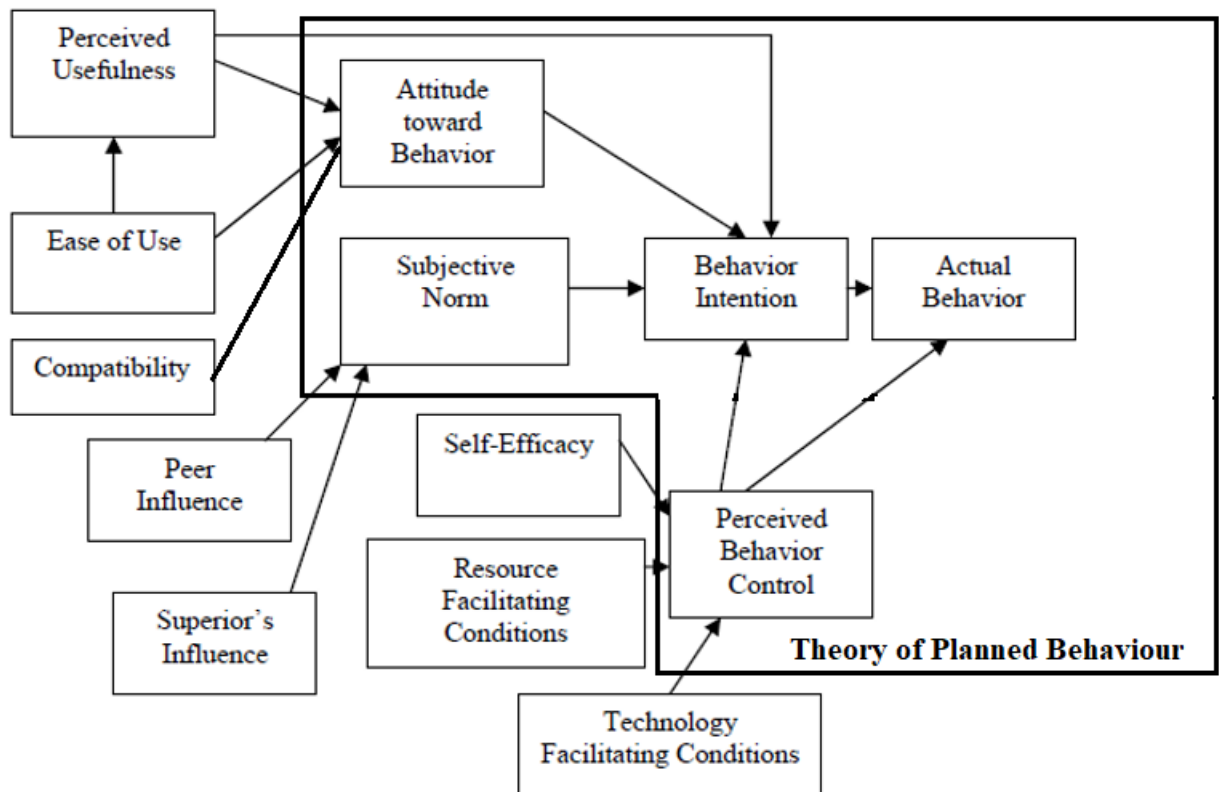
Figure 1.5 Combined TAM and TPB (Taylor and Todd, 1995)

The objective of Taylor and Todd in combining the two models is to address key problems with the constructs of Perceived Behavioural Control (PBC) in Theory of

Planned Behaviour (TPB) and Subjective Norms (SN) in TAM, which hampered real IT behaviour prediction. The difference between the three theoretical models (TAM, TPB, and DTPB) is that TPB focuses on measuring the direct attitudes, subjective norms, and perceived behaviour control to predict individuals' behaviour, and then it predicts their intentions (Ajzen, 1991). TAM focuses on the participants' attitudes toward technology acceptance. However, DTPB focuses on the relationship between the factors that affect users' intentions. Hence, DTPB is more complex than TAM because researchers deal with more factors that may influence individuals' technology use. As claimed by Taylor and Todd (1995), DTPB can used by researchers who are looking for a more complete understanding of Information Technology usage.

1.2.6. Social Cognitive Theory (SCT) 1995

Social Cognitive Theory (SCT) was developed by Albert Bandura (1986). This model was framed with five core constructs: performance outcome expectations (job-related performance); personal outcome expectations (individual esteem and accomplishment); Self-efficacy (one's ability); affect (liking of technology use); and anxiety (toward technology use). In contrast to issues of Diffusion of Innovation Theory, SCT rotates around a central concept entitled self-efficacy which is defined as 'the judgment of one's ability to use a technology to accomplish a particular job or task' (Compeau and Higgins, 1995). Hence, self-efficacy is essentially an individual's level of confidence that he or she can accomplish a given goal according to Niederhauser & Lindstrom (2018, p. 342).A s claimed by Bandura (1986), SCT takes into account the role of human actions (approach of human agency) in innovation process.

The Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), and the Innovation Diffusion Theory adopt a unidirectional perspective toward causal relationship, in which environmental factors influence cognitive beliefs, which influence attitudes and behaviours. On the contrary, SCT relies on the bidirectional nature of causation in which behaviour, cognitive and emotional factors, and environment constantly and mutually influence each other. An individual's cognitive competences influence the behaviour of using a technology, and the successful interactions with the technology also influence the cognitive perceptions as stated by Compeau et al., (1999). Figure 1.6 shows a drawing of the model.
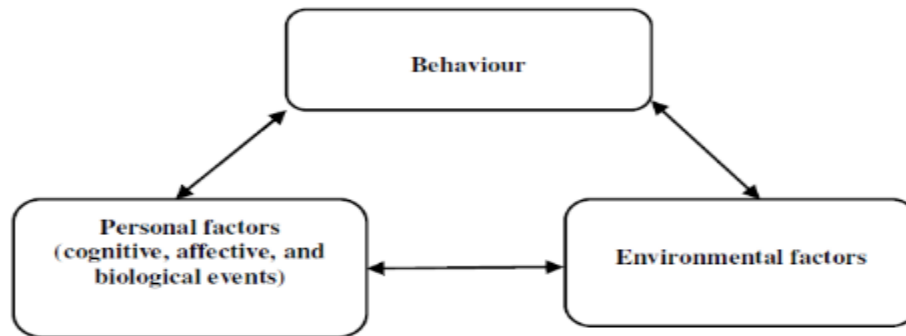
Figure 1.6 Graphic Representation of Social Cognitive Theory (Adapted from Bandura,1986;Samnan, 2017; Niederhauser & Lindstrom, 2018)

It seems that a multitude of research studies have been published investigating individual behaviour from the viewpoint of Social Cognitive Theory. For instance, Compeau & Higgins (1995) applied and extended this theory to the context of computer usage, but the nature of the model and the underlying theory allowed it to be extended to acceptance and use of Information Technology in general (Venkatesh et al., 2003). Later, Padmavathi (2014), based on the Social Cognitive Model, claimed that technology integration in schools can be studied as interaction among various factors such as availability of technology infrastructure, perception of facilities and its use by the end users, perceived self-efficacy of end users, and the perception related to possible outcome in using technology for teaching and learning in schools. Therefore, it seems necessary to search for other theories to augment the explanation of users' acceptance of technology systems within a specific educational context. TAM2 and TAM 3 are two well-known extended TA models that will be discussed next.

1.2.7. The Extended Technology Acceptance Models (TAM 2) (TAM 3)2000s

Venkatesh and Davis (2000) developed a widely known extended Technology Acceptance Model called TAM2, the "Revised Technology Acceptance Model". To overcome the limitations of the original TAM, they added three interrelated social influences: subjective norm, voluntariness, and image to predict the adoption of Information Technology. Figure 1.7 shows a schematic of the model.
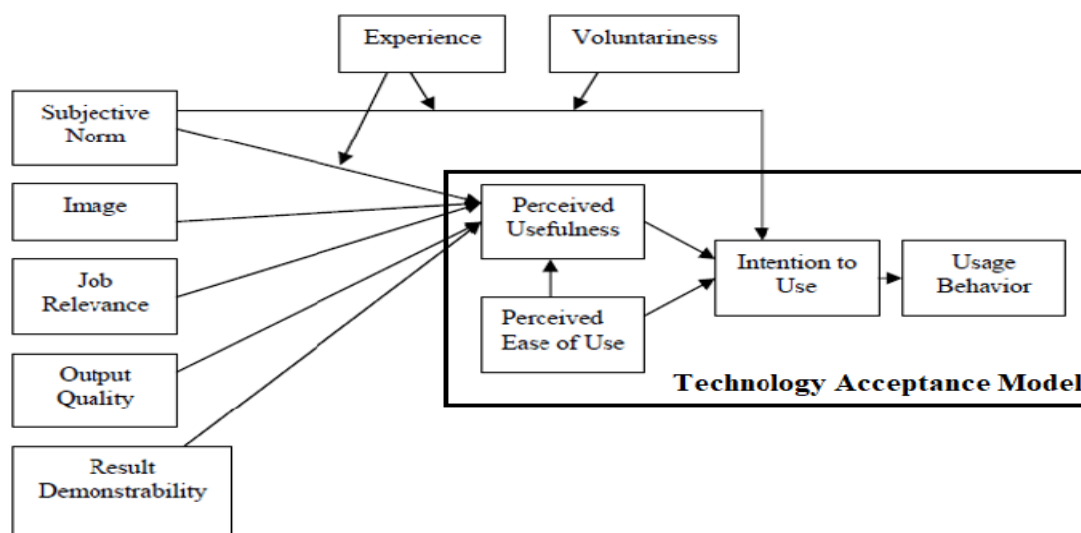
Figure 1.7 The Extended Technology Acceptance Model (TAM2) (Venkatesh and Davis, 2000)

Subjective norm refers to user's belief of what most of his/her important others believe he/she should or should not perform the behaviour to accept the technology. Voluntariness refers to the obligatory or mandatory context in which the user is placed to accept technology. Image is defined as the degree to which accepting new technology is perceived to enhance the person's status in one's social system.

Also, TAM2 theorises that there are four cognitive instrumental determinants of perceived usefulness to adopt or reject a new system: job relevance, output quality, result demonstrability, and perceived ease of use. TAM2 retains perceived ease of use from TAM as a direct determinant of perceived usefulness. TAM2 theorises that users' mental assessment of the match between important goals at work and the consequences of performing job tasks using the system serves as a basis for forming perceptions regarding the usefulness of the system (Venkatesh and Davis, 2000). The results revealed that TAM 2 performed well in both voluntary and mandatory environment.

According to Almarwani (2016), both social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) were shown to significantly influence user acceptance. Thus, the aspiration for the TAM2 was to keep the original TAM constructs intact and 'include additional key determinants of TAM's perceived usefulness and usage intention constructs, and to understand how the effect of these determinants

changed with increasing users' experience over time with the target system' (Venkatesh and Davis, 2000 p. 187).

Venkatesh and Bala (2008) combined TAM2 (Venkatesh and Davis, 2000) and the model of the determinants of perceived ease of use (Venkatesh, 2000), and developed an integrated model of technology acceptance known as Technology Acceptance Model (TAM3) shown in Figure 1.8. The authors developed the TAM3 using the four different constructs including the individual differences, system characteristics, social influence, and facilitating conditions which are determinants of perceived usefulness and perceived ease of use. In TAM3 research model, the perceived ease of use to perceived usefulness, computer anxiety to perceived ease of use and perceived ease of use to behavioural intention were moderated by experiences. The TAM3 research model was tested in real-world settings of IT implementations.
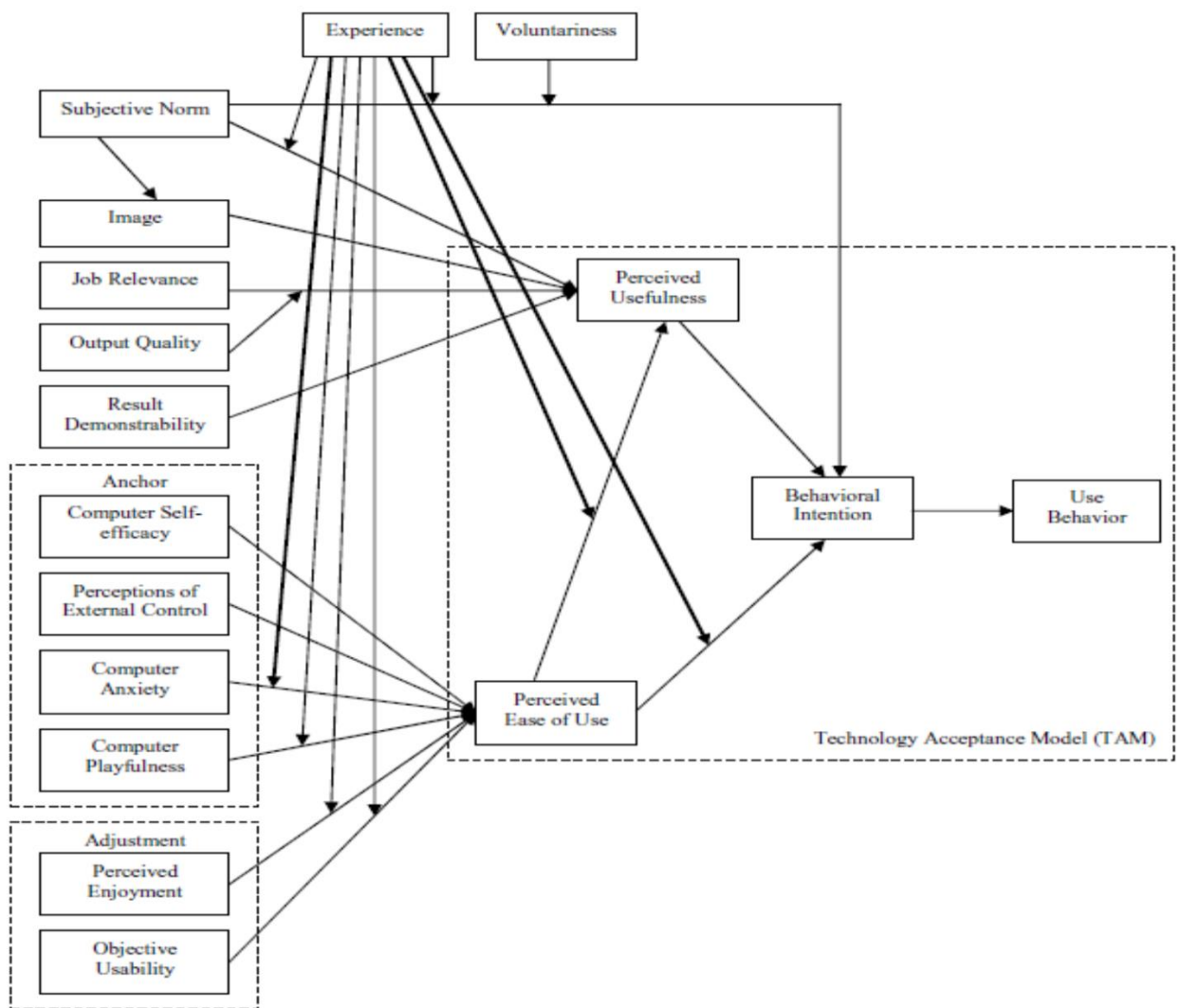
Figure 1.8 Technology Acceptance Model (TAM 3) (Venkatesh & Bala, 2008)

Because TAM2 only focused on the determinants of TAM's perceived usefulness and usage intention constructs, TAM3 by Venkatesh and Bala (2008) added the determinants of TAM's perceived ease of use and usage intention constructs for robustness. According to Venkatesh & Bala (2008) , TAM3 presented a complete nomological network of the determinants of users' Information Technology System adoption. However, an examination of current literature on technology acceptance does indicate that additional factors need to be included that were not in the original TAM models. Examples of the types of variables are : demographics, managerial knowledge, social factors, environmental characteristics, and task-related characteristics (Pijpers et al., 2001).As a result of this, researchers have searched for better technology acceptance models that can deliver a higher prediction of success. In response to this, many studies were conducted to propose modifications and changes to the original TAM, TAM2 or TAM3. The most prominent of these modifications is the proposal of the Unified Theory of Acceptance and Use of Technology (UTAUT) Model by Venkatesh, Morris, Davis, and Davis (2003) that will be explored below.

1.2.8. Unified Theory of Acceptance and Use of Technology (UTAUT) Model 2003

Based on a review of the extant literature, Venkatesh, Morris, Davis and Davis (2003) formulated and developed a unified model called the Unified Theory of Acceptance and Use of Technology (UTAUT) as an assembly of eight major competing theoretical models of technology acceptance, diffusion, and use: (1) Theory of Reasoned Action (TRA) 1975, (2) Technology Acceptance Model (TAM) 1989, (3) Theory of Planned Behaviour (TPB) 1991, (4) Model of PC Utilisation (MPCU) 1991, (5) Innovation Diffusion Theory (IDT) 1991, (6) Motivational Model (MM) 1992, (7) Combined Theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM) 1995, and (8) Social Cognitive Theory (SCT)1995 (Obienu & Amadin, 2021). As stated by Venkatesh, Morris, Davis and Davis (2003), the primary reason behind the unification of these theories and models was to arrive at the unified view of user acceptance of Information Technology. Therefore, UTAUT was formulated upon conceptual and empirical similarities across the aforementioned models (see Table 2.1 Almofadi, 2020, for a more comprehensive understanding of the origin and development of UTAUT). Figure 1.9 presents the most

basic conceptual framework underlying the class of models explaining individual acceptance of Information Technology that forms the basis of this research. It demonstrates that an individual's reactions to use technology make the individual's intention directly linked to its actual use. The dotted line in the following figure is the feedback loop from usage and reflects a user's continued intention of using the system. Hence, the 'Behavioural Intention' (BI) has a significant impact on 'Usage Behaviour' (Venkatesh et al., 2012; Alghamdi & Bayaga, 2016).
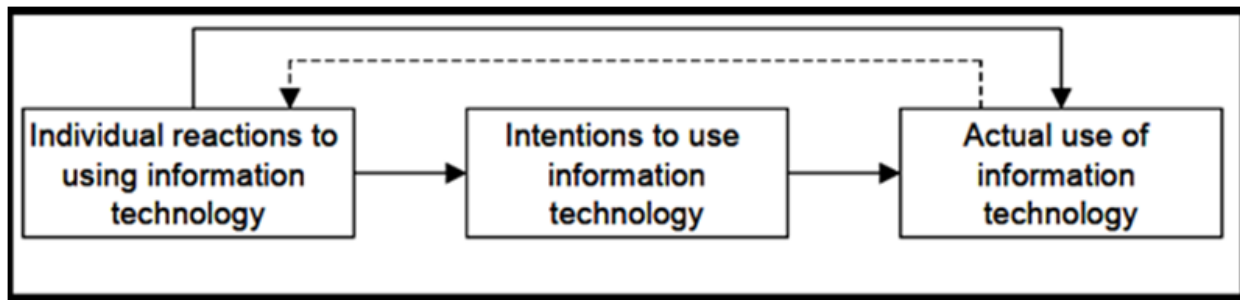
Figure 1.9 Basic Concept Underlying User Acceptance Models (Venkatesh et al., 2003 p 427)

The UTAUT model in Figure 1.10 below is comprised of four constructs that play a significant role as determinants of user acceptance and usage behaviour: *Performance Expectancy (PE)*, *Effort Expectancy (EE)*, *Social Influence (SI)*, and *Facilitating Conditions (FC)*. *PE* is defined as the degree to which using a technology is perceived as providing gains in performing certain activities; *EE* is the degree of ease associated with the use of a technology; *SI* is the extent to which an individual perceives that important others (e.g. superiors and peers) believe the individual should use a particular technology; and *FC* are environmental factors that support the use of a technology (Venkatesh et al., 2003). In UTAUT, PE, EE, and SI are theorised to have direct effects on users' Behavioural Intention (BI) to use the technology. BI and FC together determine technology use. Also, there are four moderators – namely, age, gender, experience, and voluntariness – of key relationships (Thong, Venkatesh, Xu, Hong & Tam, 2011). The UTAUT provides a unified theoretical basis for research on information technology adoption and diffusion. Figure 1.10 provides a schematic representation of UTAUT.
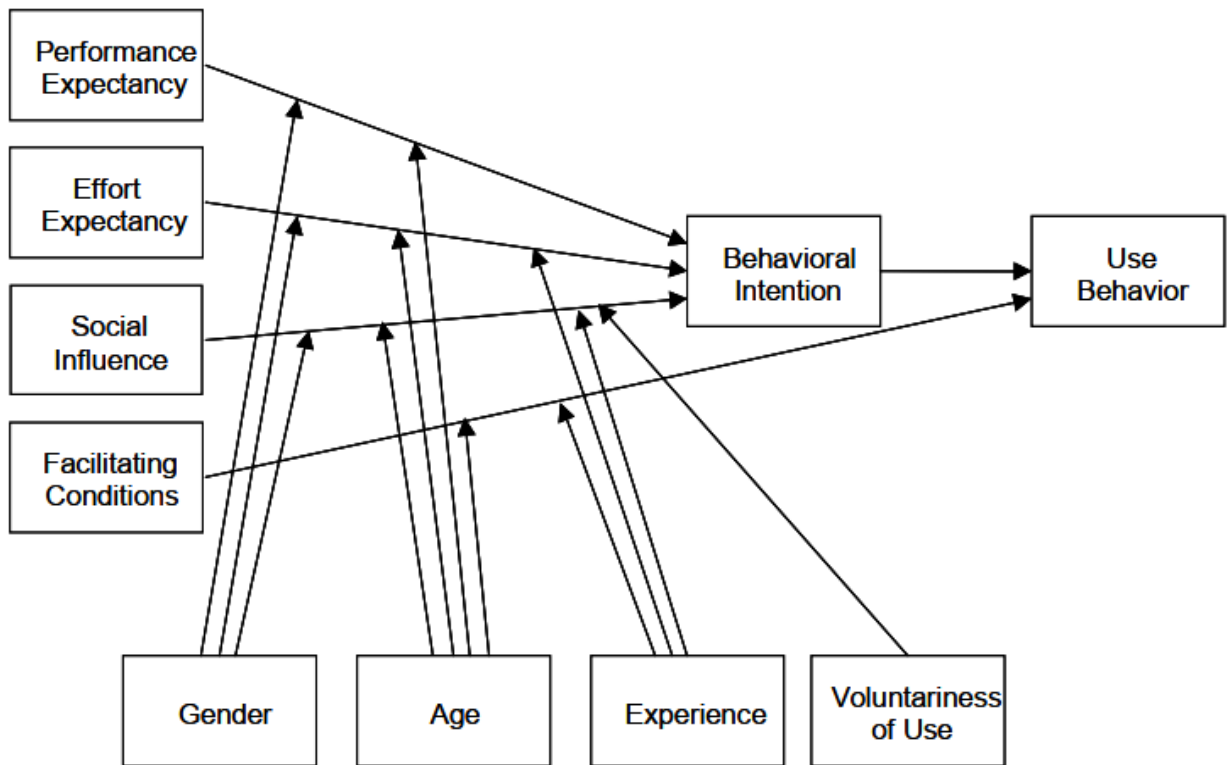
Figure 1.10 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

According to Venkatesh et al. (2003), the UTAUT (see Fig. 1.10) is the most widely used and well-supported model for explaining user acceptance of technological innovations. In order to fully understand how the UTAUT was created, an overview of the preceding eight models is diagrammatically given in Figure 1.11 below.
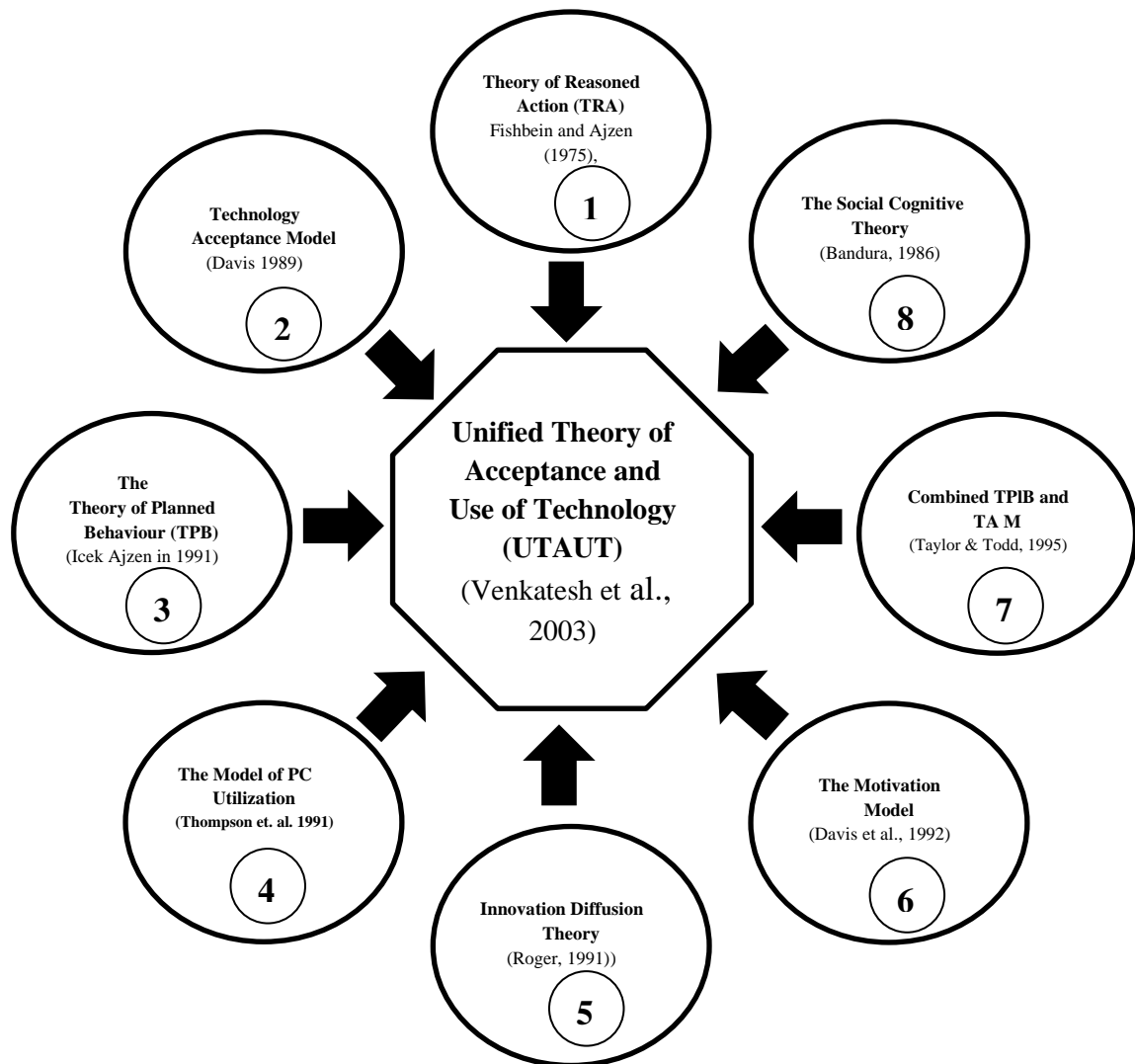
Figure 1.11 The Eight Preceding Models that (UTAUT) is based on (Venkatesh *et al*., 2003)

As explained above, several explanatory frameworks have been suggested and used to model the relationship between technology acceptance and its determinants. Hence, the inclusion of the various models served to address a common issue faced by researchers in terms of the necessity to justify the choice of model for their study. Hence, it has been argued by Surry, Ensminger and Haab (2005) that there is no single, unified, universally accepted theory of acceptance and use of Information Technology. Each theoretical model addresses different aspects of the diffusion process or a different type of innovation or organisation. Therefore, in order to understand the issues surrounding the acceptance and use of Information and Communication Technologies (ICTs) by Algerian University EFL

teachers in their teaching practices, this study uses an adaptation of the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh *et al*. in 2003 which will be discussed in more detail below.

1.3.   Theoretical Framework of the Research Study

Most of the conducted studies on individual acceptance and use of Information Technology in Education are based on theories and models from Behavioural and Information Sciences as their conceptual framework. Technology Acceptance Model and its various extensions have been used extensively by researchers and academics in a wide range of settings, including the field of education (Yeou, 2016; Altalhi, 2020).

According to Legris, Ingham, and Collerette (2003), a meta-analysis of Technology Acceptance Model research studies found that the model only explains about 40% of the variance in the dependent variable, implying the need for the inclusion of more additional antecedents of acceptance and leading to a slew of follow-up studies focusing on model expansion or refinement. Also, research literature demonstrated that the UTAUT model was able to account for 70% of variance in usage intention (Venkatesh et al., 2003; Schaper & Pervan, 2007; Thong et al., 2011; Chao, 2019; Kim & Lee, 2020; Sultana, 2020) as opposed to any of the individual eight original theories and their extensions (Venkatesh et al., 2003). One major difference between UTAUT and its precursors was that UTAUT proposed four moderators (i.e., gender, age, experience, and voluntariness) to further enhance the predictive power of the model. Since its inception, UTAUT has been used extensively in explaining the adoption of technologies by individual (Dwivedi, Rana, Jeyaraj, Clement & Williams, 2019). Thus, Venkatesh et al. (2003) recommended that future studies on the UTAUT model should include developing an in-depth understanding of the dynamics that may influence user acceptance of Information Technology.

UTAUT identifies four key factors (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) and four moderators (i.e., age, gender, experience, and voluntariness) related to predicting behavioural intention to use a technology and actual technology use (Venkatesh et al., 2003). We adapt these constructs and definitions from the original UTAUT in relation to the context of the current study. Here, *performance expectancy* is defined as the degree to which using a technology will

provide benefits to teachers in performing certain activities; *effort expectancy* is the degree of ease associated with teachers' use of technology; *social influence* is the extent to which teachers perceive that important others (e.g. family and friends) believe they should use a particular technology; and *facilitating conditions* refer to teachers' perceptions of the resources and support available to perform a behaviour (e.g.Venkatesh et al., 2003; Brown & Venkatesh, 2005). According to UTAUT, performance expectancy, effort expectancy, and social influence are theorised to influence behavioural intention to use a technology, while behavioural intention and facilitating conditions determine technology use. Also, individual difference variables, namely age, gender, and experience (note that we drop voluntariness, which is part of the original UTAUT), are theorised to moderate various UTAUT relationships.

Many attempts have been made to apply TAM with it extended model of UTAUT in the field of education that includes longitudinal field studies of employees' acceptance of technology studies on online learning (Gao, 2005), WebCT (Ngai, Poon & Chan, 2007). There were studies focusing on pre-service teacher trainees' readiness to use technology based on Technology Acceptance Model (Teo, Lee & Chai, 2008; Timothy Teo & Van Schaik, 2009; Timothy Teo, 2010).

Recent research studies in the field of Education have adopted Technology Acceptance Model as the most influential model to explain technology usage behaviour (Yeou, 2016; Scherer, Siddiq & Tondeur, 2019; Murillo, Novoa-Hernández & Rodríguez, 2020). However, research studies using Technology Acceptance Model and its extended model such as Unified Theory of Acceptance and Use of Technology are found to be limited outside the realm of the developed countries, more particularly in North African countries. In Algeria, for example, research studies using technology acceptance model as a theoretical framework to study technology use by teachers at universities is either limited or non-existent.

The research of Venkatesh et al. (2003) applying Unified Theory of Acceptance and Use of Technology was originally conducted in business organisations. Later this model has been adopted in the field of Education (Marchewka, Liu & Kostiwa, 2007; Mccombs, 2011; García Botero et al., 2018; Khan & Qudrat-ullah, 2021; Kim & Lee, 2020). Given the importance of the role of Algerian university teachers to support or inhibit the use of

Information and Communication Technology in the classroom, the theoretical framework within which this study is situated is the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003) that empirically investigates the factors that influence the use of ICT in the teaching and learning process by EFL teachers.

In light of the preceding literature, the behavioural intention (BI), in this research, has been used as a predictor of teachers' actual use of technology in their teaching practices. Hence, the theoretical framework of the current study consists of five major determinants of teachers' behavioural intention which in turn affects teachers' actual use of ICT. A diagrammatic representation of the proposed theoretical framework of the present study is given in Figure 1.12.
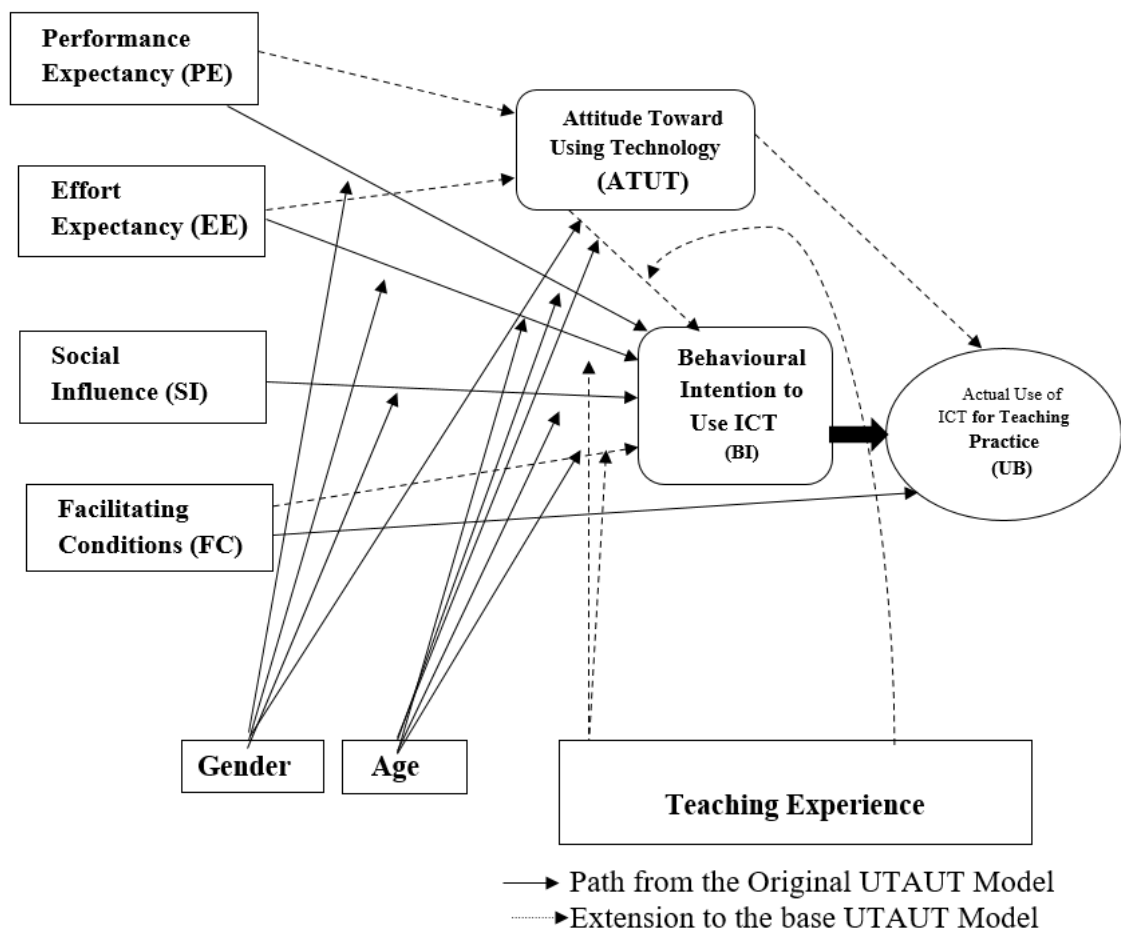
Figure 1.12 The Proposed Theoretical Framework

The arrows shown in the proposed theoretical framework above indicate hypothesised relationships between the independent and dependent variables. The relationships

indicated in the proposed theoretical framework also include the moderators derived from the socio-demographic characteristics of informants in the present study.

Through studying the UTAUT model, it is observed that there is a need to modify and add a number of elements while applying this model to the Algerian Higher Education context. Once this has been done, this model can be applied to Higher Education, in order to effectively explain the factors that contribute to teachers' technology acceptance and the barriers that may impede its use. Hence, the theoretical framework of the current study differs from the basic model of Unified Theory of Acceptance and Use of Technology (UTAUT) in the following features:

1. The current study is conducted only in a voluntary setting, Hassiba Benbouali University of Chlef, hence, the variable voluntary/mandatory is excluded;

2. The current study identifies four key moderator variables (gender, age and teaching experience) that have been found to be significant in conjunction with UTAUT model.

3. The study has used all the four exogenous constructs of the original UTAUT model (i.e. *Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SE), Facilitating Conditions (FC))*, in addition to a fifth endogenous construct '*Attitudes Toward Using Technology', though, it was theorised not to be direct determinant of intention due to the presence of performance and effort expectancies (Venkatesh et al., 2003, p. 447).*

4. The current study has used the three endogenous constructs (i.e., *Attitude Toward Using Technology (ATUT), Behavioural Intention (BI), and User Behaviour (UB).*

5. The current study positions the construct of 'attitude' as a mediator between performance expectancy and behavioural intention and between effort expectancy and behavioural intention. This is because the extent to which the Information Technology is useful and consistent with performance expectations and is easy to use can influence the individual's attitude leading to intention.

6. The moderating variable of 'teaching experience' has also been proposed in this study in order to supplement the variable experience in using a certain technology from the base UTAUT model.

7. The UTAUT specified Behaviour Intention as a dependent variable, while the current study has used *Behaviour Intention* as an independent variable.

8. The UTAUT specified Usage Behaviour as ultimate dependent variable to be examined and the present study has considered *Actual Use of ICT* as the dependent variable.

The theoretical framework for a study provides a structure and vision for the research, that is, a blueprint for examining appropriate theories and inquiries on the topic of interest (Grant and Osanloo, 2014 as cited in Almofadi, 2020). In the current study, the aim is to investigate the factors that may influence teachers' acceptance use of Information Technology to teach English as a Foreign Language (EFL) at Hassiba Benbouali University of Chlef. The readiness and acceptance amongst teachers are the key factors for investigation into user behaviours and intentions (Venkatesh et al., 2003; Venkatesh et al., 2012). A recurring concern, then, must be with the theoretical framework that is the basis for research, and how the research questions, methodology, analysis, and findings all fit into this framework (Wardhaugh & Fuller, 2015). Having discussed the underlying theoretical framework of the current study, it is important to review the different studies conducted on the status of ICT use among teachers.

1.4. Studies on Teachers' Acceptance and Use of ICT in Teaching Practices

Information and Communication Technologies have influenced and changed many aspects of our modern life, including education. Teachers in the developing countries are expected to make more use of ICT and extend its use beyond specialist subjects to the everyday practice of teaching and learning. The systematic use of ICT in education is becoming increasingly important because of the different roles it can play and its promised advantages for the teaching and learning process(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009)(Oyaid, 2009).ICT gained its importance at Universities due to the different possibilities it can offer in the field of education. In addition to enhanced learning and increased motivation, there is a lot of literature on the perceived advantages of ICT in education. ICT usage in the classroom can assist in delivering the curriculum by using real-world problems and provide scaffolds and tools for learners to enhance their learning.

The advantages to be gained from ICT usage in education are among other reasons for its use. According to Hawkridge (1989), there are three rationales for ICT introduction into schools:

- *Economic Rationale*: it is necessary for a society to satisfy its requirements to have skilled technological workers. Baines (2005 as cited in Oyaid, 2009, p. 34) pointed out that the conventional structure of employment is breaking down and there is an emerging range of work patterns requiring new skills. Thus, learning has to be related to future jobs and careers.

- *Social Rationale*: as a result of widespread use of ICT in all life aspects, all students should know about and be familiar with ICT as a preparation for their future active roles in society and to become well-informed citizens. ICT competence has become an important indicator of one's competency, especially in the workforce market. Therefore, ICT competency is on some occasions an indicator of the social antecedence of individuals as stated by Al-Saif (2006).

- *Pedagogical Rationale*: this realises the role of ICT in improving and enhancing teaching and learning.

   Smerdon et al. (2000) pointed to the fact that life and work places have changed dramatically as a result of the introduction of ICT and so have the required skills and knowledge children will need to become active members of their societies. Accordingly, the educational experiences children are exposed to at school should adapt to the changes in the world around them. Thus, Watson (2001) offered two rationales for ICT use in schools. The first is learning about ICT tools and skills to reflect the use of ICT in the outside world, the second is learning with and through ICT to enrich and extend learning and increase students' confidence in using ICT to perform everyday applications. Al-Saif (2006) added other rationales:

- *Motivation Rationale:* a well-designed ready-made software motivates its users to create and invent new uses with the features it offers and that opens up new horizons to develop and improve their skills.

- *Informatics Rationale:* besides the importance of manufacturing the component parts of ICT, it is equally important to prepare highly qualified human resources capable of software engineering. That is the core of technological development developing countries are concentrating on as it will have a positive impact on their economies.

- *Special Needs Rationale*: the requests of special educational needs students, including the gifted and talented, will be met by either artificial intelligence software or software

which is designed based on constructivist educational methods to provide scaffolds and tools to enhance students' learning.

However, it is important here to differentiate between the rationales for ICT's introduction at universities and the reasons for its use. According to Oyaid (2009), the rationale for ICT's introduction in schools is associated with educational policy, and its validation and justification are the responsibility of policymakers, whereas the reasons for ICT use are linked to teachers who usually find specific reasons that motivate, encourage, and incentivise them to use ICT in their teaching. A plethora of research studies have investigated the reasons that motivate teachers to use ICT in their teaching practice. Generally speaking, they are related to the benefits to the teacher, student, or the process of delivering information. For instance, Wishart and Blease (1999) listed a number of reasons, such as ICT increasing motivation to learn and increasing ease of learning because it is enjoyable and interesting to use. The enjoyment aspect of ICT use has another positive effect as it attracts attention and increases concentration, which enables more independent learning (Ibid). According to Downes (2001), learning and working have become much easier using ICT. In the report entitled 'Making better connections', Downes (2001) listed four goals of introducing ICT into the classroom: ICT as an object of study, ICT as a tool for learning, ICT as integral to both subject matter and pedagogy, and ICT as integral to the reform of schooling in terms of pedagogy, content, and organisation and structure of schooling.

In addition to students' interest and enjoyment of technology, Baines (2005) pointed to other reasons for teachers' ICT use. They include the ability to do and build things using different software, the ease of getting, using and presenting information, it facilitates greater independence of learning for the students, and it promotes the importance of communication for different purposes, which is 'a life core skill'.

In these days, the uses of technology in the area of Education are growing and have invaded all walks of life. Hence, there is a growing number of empirical studies that attempts to explain the factors that support and/or hinder teachers' acceptance and use of Information Technology in their teaching practices in the milieu of Higher Education throughout the world. For instance, Oye, Iahad and Rabin (2011) sought to understand why teachers at the University of Jos Plateau State in Nigeria accept or reject new Information

or Communication Technology. The study combined the models TAM and UTAUT to understand the teacher's behavioural intention on the acceptance and use of the technology. The study adopted the questionnaire as data collection tool. The findings showed that performance expectancy was the most influential factor for the acceptance and use of ICT by the informants. Likewise, Oye et al. (2014) sought to understand the most influential factors for the acceptance and usage of ICT by the academic staff of the Adamawa State University (ADSU) in Nigeria and to identify the barriers. The findings showed that the four constructs of UTAUT (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)) had significant positive influence and impact on the behavioural intention to accept and use ICT by the ADSU academic staff. This demonstrated that University Academic Staff would intend to use ICTs that they believed would improve their job performance and were easy to use. In the Adamawa State University, EE and SI were found to be the most influential predictors of academic staff acceptance of ICT and use among the four constructs of UTAUT. The greatest barriers were time and technical support for staff.

Furthermore, Al-Khasawneh (2012) examined the potential prominent factors related to the adoption and usage of ICT in Jordanian Higher Education Institutions (HEIs) among the academics. The study applied the Diffusion of Innovation theory, Theory of Planned Behaviour and the Decomposed Theory of Planned Behaviour. A self-administered survey was conducted on 500 academic staff selected from public HEIs in Jordan. The findings showed that subjective norms, attitude towards technology, and perceived behavioural control positively influenced academics' Behavioural Intention to use ICT in HEIs.In Hong Kong, Wong (2016) investigated teachers' acceptance of technology and the influencing factors behind their acceptance. This study took a quantitative approach to investigate 185 primary teachers by using Structural Equation Modelling on a customised Technology Acceptance Model. The results showed that perceived ease of use and perceived usefulness of the technology had little influence on behavioural intention of use. However, facilitating conditions were found to be a strong dominating factor.

Furthermore, Garone et al. (2019) described the technology acceptance profiles of University teaching staff, by using the UTAUT predictor variables, in the context of the implementation of a new Learning Management System (LMS). Using a modified UTAUT

questionnaire, 244 University teaching staff, comprised of post graduate students, assistants and professors from a Flemish University in Belgium, participated in a survey focusing on their acceptance and use of the new LMS. The emerging profiles were consistent with Rogers' diffusion of innovations theory, showing a group that scored high on the UTAUT scales, corresponding to early adopters, a second group with moderate scores corresponding to the early majority and a third group with overall lowest scores corresponding to the late majority. Of the three groups, the early adopters were most willing to innovate, while the other two would likely require additional support to start using or innovating. Both social influence and ease of use played a significant role in the early majority and late majority.

In another study conducted by Hu, Laxman and Lee (2020) who investigated the factors influencing academics' behavioural intentions to use, as well as the actual usage of mobile technologies in six Higher Education Institutions in China.This study fully adopted the UTAUT2 model and introduced four moderators (gender, age, teaching experience, and discipline) with some minor modifications to wording and constructs to focus on academics' behavioural intentions and use behaviour of mobile technologies.638 informants responded to the questionnaire (67%). Specifically, 254 (40%) informants were from the Faculties of Languages; 193 from the Faculties of Science & Engineering (30%), and 191 from the Faculties of Business & Management (30%). The Statistical Package for Social Sciences (SPSS) 24.0 and SmartPLS-SEM 3.0 were used to analyse the data gathered through the quantitative study. The findings showed that performance expectancy, facilitating conditions, hedonic motivation and habit were the most significant factors affecting academics' behavioural intention and behaviours of use. Moreover, gender, age, teaching experience and discipline were found to be moderating factors.

Concerning the Algerian context, there was only one study conducted in the field of e-commerce by using the Unified Theory of Acceptance and Use of Technology (UTAUT). In this regard, the researchers Sbaa and Benyakoub (2020) in an article unveiled the factors affecting Algerian consumers' attitudes towards electronic payment card. A questionnaire was designed and distributed to a sample group of 81 consumers in one of the Algerian cities (Bouira). The findings showed that consumers held positive and strong attitude towards the electronic payment card. Besides, performance expectancy and effort

expectancy were the most important factors influencing consumers' attitudes while social factors had the least impact.

It follows that understanding the factors that influence the acceptance of ICT by users will be of paramount importance in improving the implementation and use of ICT. However, this is not always easy. Indeed, one of the most challenging research questions in the area of Information Systems and Information Technology is to understand why individuals choose to accept or reject new technologies as stated by Henderson and Divett (2003). Therefore, it becomes apparent from the above discussions that without finding a number of advantages for a particular technology, there will be no acceptance of this technology, since every user searches for the best. Thus, when users find a new technology easier and more useful compared to the previous technology, they obviously adopt it.

Whilst a large amount of research has investigated the implementation of Information Technologies in Education in some developed countries, there is still a paucity of empirical studies from a teaching perspective across disciplines within Higher Education in the Arab World. For this reason, this study investigated the factors influencing EFL teachers' acceptance and use of educational technologies within the context of Higher Education Institutions in Algeria.

In light of the evidence discussed above and given the importance of teachers' use of ICT in the teaching practice, this study will not examine the whole range of factors influencing ICT usage, but rather focus on psychological and socio-demographic factors that influence teachers' ICT use in the classroom practice. These factors include *Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, Behavioural Intention, and Teachers' Demographic Characteristics (e.g., gender, age, and teaching experience)* which will be discussed in the following section.

1.5. Factors Related to Teachers' Pedagogical Use of ICT

In this section, a wide range of factors that may influence teachers' use of ICT are presented. The variations in the factors identified by different researchers might be attributed to differences in context, participants, and type of research. However, this review of research literature aims at providing a link to the variables whose relationship with ICT

usage has been theoretically and/or empirically well-supported, including Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards using Technology, and socio-demographic characteristics.

While many scholarly papers tried to clearly identify these influential variables, it seems that there is still a lack of consensus about the universal factors that influence teachers' use of ICT. Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards using Technology, and Socio-demographic characteristics are among the factors that we consider to be important as they have been frequently tested in research and discussed in international scholarly papers. Even taking into account that all the six aforementioned factors are significant, there seems to be still no clear understanding of how and why these factors may affect teachers' actual use of ICT in their teaching practices.

A plethora of research studies conducted on technology acceptance and use are based on a variety of theoretical foundations across a variety of settings, such as Innovation Diffusion Theory, Behaviour Intention Theory that includes Theory of Reasoned Action, Theory of Planned Behaviour and Technology Acceptance Models and Social Cognitive Theory. The literature review presented here is confined to technology acceptance model and its extensions as applicable to the field of education.

As noted above, studies have pointed to a wide range of factors affecting teachers' use of ICT. The variations in the factors identified by different researchers might be attributed to differences in context, participants, and type of research. This section presents a set of psychological and socio-demographic variables whose relationship with actual use of ICT has been theoretically and/or empirically well-supported.

1.5.1. Teachers' Socio-Demographic Factors and Pedagogical Uses of ICT

Numerous scholars have studied how teacher characteristics influence teachers' classroom technology acceptance and usage. In the literature, it is stated that effort expectation, performance expectation, social influence, attitude, and behavioural intention may differ according to the moderating role of demographic factors (Şahin, Doğan, İlic, & Şahin, 2021; Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012).

Some of the socio-demographic factors that have been explored in the existing literature by scholar researchers include gender (Kellenberger & Hendricks, 2003; Zalah, 2018), age (Lokken, Cheek, & Hastings, 2003; Alkhasawneh & Alanazy, 2015), and years of teaching experience (Zidon & Miller, 2002; Šumak & Šorgo, 2016). However, in the course of researching and reviewing the many studies that concerned teachers and the use of technology in their teaching practices, it became obvious to us that several conflicting findings exist concerning the relationship between socio-demographic characteristics such as gender, age and teaching experience, and the actual use of ICTs by teachers. The following sections describe studies investigating some of the major socio-demographic factors associated with teachers 'actual use of ICT.

- *Teachers' Gender*

Gender is the first moderating variable to be considered in this study. Gender as a demographic factor is considered to the most investigated mediating factor in technology acceptance and use. There are conflicting reports on the role of gender in the use of ICT. While some studies found no direct relationship between gender and computer use (Kellenberger and Hendricks, 2000; Shapka and Ferrari, 2003; Birgin, Çoker and Çatlioglu, 2010; Bakr, 2011; Rana, 2012), other studies however, reported the existence of a certain relationship (Venkatesh & Davis, 2000; Tezci, 2009; Mensah, Zeng, & Luo, 2020) and stated that males tend to be more technologically savvy and willing than females to learn about new technology (Yuen & Ma, 2002) .Hence, gender difference in perceived usefulness, ease of use, attitude towards ICT use, intention to use ICT and self-reported use of technology has been discussed here.

In a study conducted at a South-western Ontario University in Canada, Kellenberger and Hendricks (2003) reported that they did not observe any differences in the use of computers between male and female pre-service teachers. A similar finding was also reported by Birgin, Çoker and Çatlioğlu (2010) and Bakr (2011) whose studies showed no direct relationship between gender and attitudes towards the use of computers. Maybe, because gender is not really a differentiating criterion in this society, as opposed to the Algerian society.

Godin and Leader (2013) claim that today's generation of students, both males and females, are increasingly computer savvy. Hence, learners have developed multiliteracies as a result of growing up in an environment brimming with modern technologies. Women and men in this age group may be equally proficient with using technologies such as video conferencing systems and group collaboration systems, more so than past generations. The technologies of this age, including smart phones, tablet computers, and social networking applications, have contributed to this new gender-neutral phenomenon of computer application expertise. Thus, gender is not a significant moderator of performance expectancy in this study. In contrast, other studies show that gender has moderating effects (Venkatesh & Davis, 2000; Raman, Don, Khalid, & Rizuan, 2014; Maican, Cazan, Lixandroiu, Dovleac, & Maican, 2021).For example , Venkatesh and Morris (Venkatesh & Davis, 2000) identified a significant difference between female and male in introducing a system for information retrieval. They found that men emphasized more on perceived usefulness in determining behavioral intention to use technology, while women regarded perceived ease of use as a more significant factor in determining behavioral intention to use. Furthermore, research has revealed that gender and age play a moderating role: gender, when related to PE with BI, has proven to have a stronger relationship in the case of males than in the case of females (Raman et al., 2014) ,and gender differences moderate the effects of social influence (Wang et al., 2009).

The results of various research studies discussed above show mixed results with regard to the influence of gender on performance expectancy (perceived usefulness), effort of expectancy (ease of use), attitude and intention to use ICTs. The effect of gender on actual use of ICT differs. Based on the review, it would be of research interest to test the proposition that: (a) perceived usefulness of ICTs is stronger among females than males; (b) influence of attitude towards ICT use upon intention to use is stronger for females than males; (c) influence of perceived ease of use of ICTs upon the perceived usefulness is stronger for males than females. Therefore, the difference between male and female is expected to be significant in the current study.

• *Teachers' Age*

Age is another moderator variable that will be investigated in the present study. Different experiences of different age groups may influence one's intention to use ICTs. Many studies were conducted to find the relationship between teachers' age and their intention to the use of ICT (Khechine et al., 2014). For instance, Blankenship (1998) found that age was the most important demographic variable affecting computer use and attitudes. Davis (1989) found a significant correlation between teachers' attitudes and age. Many studies have shown that the senior and more experienced teachers are less receptive towards computers compared to the younger ones (Young, 2000).

Lokken, Cheek and Hastings (2003) in their study on impact of intensive training found that older teachers exhibited higher levels of computer anxiety and had less confidence in technology. Jamieson-Proctor et al., (2006) found that teacher resistance to change was more among older teachers is evident in Queensland. This may be because older teachers may have only a limited exposure to computers and their usage. For them learning to use a computer in the classroom is a new skill and may result in different attitudes towards ICT. On the other hand, young teachers may have been exposed to computers as part of their school and college.

Kumar et al., (2008a) conducted a study on the factors that influence the effective use of technology among Malaysian Teachers. They found no significant difference in the age of teachers and the actual use of computers among Malaysian teachers. The study indicates that younger teachers are more enthusiastic in using computers but the senior and more experienced teachers were not far behind.

In their study of technology acceptance among academic staff at Aljouf University in Saudi Arabia, Alkhasawneh & Alanazy (2015) found that the impact of the moderating factors of gender and age lessened as technology becomes more generally used by both genders and all ages, especially in an academic group such as university teachers who are likely to be familiar with it.

There appears to be conflicting results in the literature with respect to age as a factor related to behavioural intention and actual use of ICTs. Most often supported findings of influence of age are: (a) senior teachers tend to be more anxious and less confident in using ICTs; (b) younger teachers' perceived computers are more useful than

senior teachers; (c) younger teachers have more desire to the use of ICT; (d) younger age group teachers have better scores in use of ICT as against older age group.

- *Teachers' Years of Teaching Experience*

Years of teaching experience is another demographic factor that has been examined in several studies as a predictor of faculty and teacher decisions to adopt technology in their teaching (e.g. Hu, Laxman, & Lee, 2020; Šumak & Šorgo, 2016). Though some of the researchers reported that teachers' experience in teaching did not influence their use of computer technology in the classroom (e.g. Bakr, 2011; Mueller, Wood, Willoughby, Ross, & Specht, 2008; Niederhauser & Stoddart, 2001), others showed that teaching experience did influence the successful use of ICT in classrooms (e.g., Egbert, Paulus, & Nakamichi, 2002; Giordano, 2007; Hernández-Ramos, 2005; Inan & Lowther, 2010; Lai & Smith, 2018; Sadik, 2006). Bakr (2011:315) reported to have found no significant relationship between computer attitudes and the teaching experience among Egyptian teachers. This finding is contrary to findings reported by Sadik (2006:108) after his study conducted, five years earlier, also in Egypt. He reported that teachers with more years of teaching experience showed more positive attitudes towards computers and were more likely to appreciate the importance of computer use in the classroom than those with less experience. Similarly, (Crooks, Yang, & Duemer, 2002, p. 110) found that academic staff with more years of teaching experience and those teaching at doctoral and research institution had the most favourable attitude toward using the ICT.

Several studies have been conducted that addressed the relationships between selected soio-demographic variables such as teaching experience and usage of ICT. One such study was Zidon & Miller (2002) who found weak relationship existed between years of teaching with computer usage. Conversely, in a study of teachers' usage of computers, Martin & Lundstrom (2002) found that almost 60% of the teachers in their study who had under 10 years of teaching experience believed computers in the classroom were essential and hence they used it extensively, while only 25% of teachers with over 20 years of teaching experience shared this belief. In general, teachers have different reasons for using or avoiding technology, but those who have more experience in teaching and in technology use, especially in practice, are more likely to integrate technology in their classrooms (Egbert et al., 2002). Thus, research literature has shown that experience with the use of

technology has an influence on intention to use and actual use of Information Technology (Thompson et al., 2006).

However, Niederhauser & Stoddart (2001) reported that teachers' experience in teaching did not influence their use of computer technology in teaching. Gorder (2008) claimed that teacher experience is significantly correlated with the actual use of technology. In her study, she revealed that effective use of computer was related to technological comfort levels and the liberty to shape instruction to teacher-perceived student needs. In a Meta-analysis and review of 81 empirical research reports, Rosen and Maguire (1990) concluded that teachers teaching experience does not eliminate computer phobias and many experienced teachers display some wariness, discomfort and/or mild anxiety in relation to computers.

Over the years, computer usage issues related to various subjects taught have been debated in the literature in accordance with teaching experience. Though some research reported that teachers' experience in teaching did not influence their use of computer technology in teaching (Niederhauser & Stoddart, 2001), most research showed that teaching experience influences the successful use of ICT in classrooms (Giordano, 2007; Hernández-Ramos, 2005). Nevertheless, Baek et al., (2008) claimed that experienced teachers are less ready to integrate ICT into their teaching. Just like in Algeria, teachers tend to stick to '*traditional*' methods.

Similarly, the American National Centre for Education Statistics in 2000 reported that teachers with less experience in teaching were more likely to integrate computers in their teaching than teachers with more experience in teaching. According to the report, teachers with up to three years teaching experience reported spending 48% of their time using computers, teachers with teaching experience between 4 and 9 years, spend 45% of their time using computers, teachers with experience between 10 and 19 years spend 47% of the time, and finally teachers with more than 20 years teaching experience use computers 33% of their time. The reason to this disparity may be that fresh teachers are more experienced in using the technology. Further, Russell et al., (2003) conducted a study on the extent of ICT adoption among 250 secondary school teachers in Malaysia. Their findings revealed that new teachers who were highly skilled with technology more than older teachers did not incorporate ICT in their teaching. The researchers cited two reasons: new teachers

focus could be on how to use ICT instead of how to incorporate ICT in their teaching. Secondly, new teachers could experience some challenges in their first few years of teaching and spend most of their time in familiarizing themselves with school's curriculum and classroom management.

However, Granger, Morbey, Lotherington, Owston and Wideman (2002) conducted a qualitative survey on factors contributing to teacher' successful implementation of ICT in Canada. They interviewed 60 informants from four "Elementary" and "Lower secondary" schools in Ladyslipper, Ravine, Main Street and Wildrose. The findings found no relationship between teachers' teaching experience and experience in the use of ICT implying that teachers' ICT skills and successful implementation is complex and not a clear predictor of ICT integration.

The results obtained above showed that there were mixed results on the relationship between teachers' experience and ICT implementation. Some studies showed that there was significant difference between ICT implementation and teachers' experience while other studies showed the opposite.

1.5.2. Performance Expectancy (PE)

As mentioned by Venkatesh *et al.* (2012), Performance Expectancy (PE) is the extent to which the use of a particular technology is perceived as offering a number of advantages to the users throughout the process of performing particular tasks. Similarly, according to David and Rahim (2012), performance expectancy is actually a perception of a person that the use of ICT can be useful in performing different teaching activities .In the scope of the present study, Performance Expectancy is defined as the degree to which a teacher thinks that using ICT in teaching can increase her/his job performance. Hence, PE refers to the advantages in using ICTs as perceived by the informants.

The researchers Alotai bi and Wald, (2014), Dwivedi et al., (2019), Kim & Lee (2020), and Zalah (2018) stated that Performance Expectancy has consistently proved to be the most significant forecaster of Behavioural Intention (BI) for technology use because users usually look to predicting the degree of benefits to be gained from a particular technology. According to Alotaibi and Wald (2014), Performance Expectancy is the extent to which individuals thought that using the system would benefit their performance of tasks. As such, it is a strong forecaster of intention in both mandatory and voluntary settings. Thus,

PE is one of the most significant factors in determining the level of acceptance and use of technology, because users usually predict the degree of benefits to be obtained from the use of a particular technology.

The construct of Performance Expectancy is formed from the combination of five factors from different models: perceived usefulness (Technology Acceptance Models), extrinsic motivation (Motivational Model), , job fit (PC Utilization Model), relative advantages (Innovation Diffusion Theory), and outcome expectations (Social Cognitive Theory)(Venkatesh et al., 2003). Performance Expectancy replicates perceived usefulness associated with the usage of technology, which suggests that when users gain several advantages from using the technology, the efficiency and performance of that technology will be accepted. Consequently, Performance Expectancy will influence the satisfaction of user and their intention to persist with use (Alwahaishi & Snásel, 2013) .According to Bere (2014), PE is a good predictor of intention to use Information Technology; and it can be applied to an educational context. Learners will perceive e-learning as precious if it allows them to accomplish their learning aims and objectives with more flexibility and speed or even enhances learning.

Pullen et al., (2015), in their study of how pre-service teachers in Malaysia used digital technologies in their learning, found that Performance Expectancy was one of the factors that significantly determined behavioural intention to use digital technology for learning. In a wider study of technology acceptance, Momani & Abualkishik (2014) reviewed eleven models used in studies of e- learning. They found that elements used by the UTAUT model were most widely used in these studies; and that, of these, PE was the most influential factor. The literature generally concurs that Performance Expectancy is the strongest predictor of an individual's Behavioral Intention to use an information system/technology and is significant at all points of measurement for mandatory and voluntary settings (Venkatesh et al., 2003; Zalah, 2018).

A lot of prior research presented evidence that Performance Expectancy plays a key role in ICT acceptance in classrooms. For instance, Ouedraogo (2017) conducted a study among teachers from the University of Ouagadougou in Burkina Faso by using the model of Unified Theory of Acceptance and Use of Technology (UTAUT) to assess the determinants of acceptance and educational use of ICT by teachers. The findings of the

study showed that the construct 'Performance Expectancy' of ICT (expected utility and expected results) positively affected the teachers' acceptance of ICT. Similarly, a study by Oye et al., (2011) titled '*A Model of ICT Acceptance and Use for Teachers in Higher Education Institutions*' found that among the four constructs in UTAUT, 'Performance Expectancy' (PE) is the most influential factor towards the acceptance and usage of ICT among teachers at the University of Jos Plateau State, Nigeria. 78% of the informants believed that ICT use in their work will increase their opportunity for promotion.

In a recent study in the Kingdom of Saudi Arabia, Alkhasawneh & Alanazy (2015) developed a survey based on the instrument established by Venkatesh, et. al. (2003) to determine the major factors contributing towards academic staff's intention to adopt ICT at Al Jouf University. Sixty academic staff members from different colleges in the Al Jouf University participated in this study. The results of the study showed that Performance Expectancy had a strong effect on behavioral intention to use ICT at Al Jouf University.

Consequently, in this research, Performance Expectancy was investigated in order to answer the following question: ***To what extent does Performance Expectancy influence teachers' behavioural intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?***

1.5.3. Effort Expectancy (EE)

Venkatesh *et al.* define Effort Expectancy (EE) as 'the degree of ease associated with the use of the system' (2003, p. 450). Effort Expectancy is considered a very significant factor because it aids users in the process of assessing the extent to which efforts are demanded for the usage of particular technology (AlAwadhi & Morris, 2008). According to Lowenthal (2010), in an educational context, EE is identified as the degree to which users believe that ICT tools are easy to use. Pynoo et al. (2011) suggest that EE is related to technology acceptance constructs concerned with perceptions about how easy it is to use particular technologies, such as the TAM's perceived ease of use. Furthermore, it is indicated that the influence of perceived ease of use has the same effect as EE when it comes to the satisfaction of users and persistence of usage (Alwahaishi & Snásel, 2013).

According to Ghalandari (2012), Effort Expectancy is the degree of convenience perceived for the usage of a system; and is semantically akin to constructs in other theories and models; notably, complexity (Innovation Diffusion Theory and PC Utilisation Model),

and perceived ease of use (Technology Acceptance Model). Khechine et al. (2014), point out that EE is the second independent variable in the UTAUT; and may become an issue for users once they realise the challenges involved in using a particular technology. Technologies that are perceived as easy to use are more likely to inspire users to adopt them.

Tosuntaş et al. (2015) surveyed 158 Secondary level teachers in Turkey about their use of interactive whiteboards in order to examine the relationship between elements in the UTAUT model. Their findings support those of (Moran, Hawkes & El Gayar, 2010; K.-T. Wong, Teo & Russo, 2013) in that Effort Expectancy had a positive effect on behavioural intention to use the boards. Generally, teachers say that they are more likely to make use of equipment that they find easy to use and this has implications for universities finding solutions to hard and software difficulties that teachers may encounter.

It should be noted, however, that the impact of EE is fluid, as Bellaaj et al. (2015) discovered in their study of student acceptance of a virtual learning system at the University of Tabuk in Saudi Arabia. Their study revealed that EE does have a positive impact on behavioural intention but that decreases with experience, whereas the reverse is true of Performance Expectancy. Thus, as users become more knowledgeable and confident about using systems, they are less worried about how easy it is to use. Nevertheless, the literature reveals that Effort Expectancy is important in determining whether users intend to make use of technology or not.

Consequently, in this research, Effort Expectancy was investigated in order to answer the following question: ***To what extent does Effort Expectancy influence teachers' behavioural intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?***

1.5.4. Social Influence (SI)

Social influence is an equivalent to subjective norm, which is studied in both Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) as a significant determinant to explain system adoption (Wei et al., 2009). Social Influence (SI) is defined by Venkatesh et al. (2003) as 'the degree to which an individual perceives that important others believe he or she should use the new system' (Venkatesh et al., 2003). Social Influence is identified as the impact that the views of significant others (such as friends

and colleagues) about the technologies in question exert on the user. In the current study, Social Influence refers to the University teachers' perception of the extent of influence exerted by the significant others in making a decision to use computer. Significant others can include family, colleagues, bosses or subordinates and people who are considered to be important by the informant. Also, social influence is further acknowledged in the UTAUT besides performance expectance, effort expectance, and facilitating conditions to have a direct effect on the behavioural intention to use the technology (Venkatesh et al., 2003).

In the world of technology acceptance literature, social influence as subjective norm was referred to the perceived social pressure about whether to adopt a specific behaviour. Social pressure can be applied by family, friends or relatives. The researchers (Lu et al., 2005) Lu et al (2005) defined social influence as social network pressure about conducting or not conducting a certain behavioural decision when belonging to different social circles. Venkatesh et al., (2003) differentiate between social influence in mandatory and non-mandatory contexts because they found it to be significant in the former context, but not in the latter.

A large number of studies have cited the importance of Social Influence (SI) in shaping Behavioural Intention (BI) (Alkhasawneh & Alanazy, 2015). Teachers tend to comply with the social expectation of significant others' (such as Principal, colleagues, students and professional body) opinion. For instance, Venkatesh & Morris (2000) confirmed that an important role was played by social influence to determine user acceptance and behaviour of adapting new information technologies. Pedersen & Ling (2002) suggested that social influence cannot be ignored in any adoption model because of its role in adoption behaviour. It is found that subjective norm is an important predictor of intention to use ICT. Similar findings on the importance of social influence on use of technology was provided by Lewis, Agarwal and Sambamurthy (2003) who suggested and empirically verified that the perceived social influence from referent others has a significant positive influence on individual beliefs about the usefulness of technology. Similarly, recent studies have found that social influence positively and significantly affects ICT usage (Alkhasawneh & Alanazy, 2015; Kim & Lee, 2020; Shah et al., 2020; R. Thompson et al.,

2006). Extensions to the TAM likewise introduced '*social norm*' as an important construct related to beliefs about the usefulness of technology (Venkatesh et al., 2003).

Moreover, Kocaleva et al., (2015) surveyed teaching staff at all 13 Faculties in the University of GoceDelev in Macedonia and found that SI was a very significant factor in determining behavioural intention. Staff there, generally agreed that significant others in the workplace both wanted them to use e-learning (75%) and that the management supported them in this (80%). In another study conducted by Oye et al., (2014) at the Adamawa State University in Nigeria. The results showed that Effort Expectancy and Social Influence were the most influential predictors of academic staff acceptance of ICT and use among the four constructs of UTAUT.

Ajzen's ideas of the relationship between social influence and human intention have been widely used for explaining people's reaction to technological innovations. For example, in the literature on introducing/extending the use of ICT in an organisation, Ajzen's concepts of subjective norms usually serve as the essential basis for understanding the impact of social influence on people's reaction to ICT adoption (e.g., Venkatesh & Morris, 2000). Apart from this, in the educational field, Chou (2006) undertook the studies which used the Theory of Planned Behaviour to explore and explain the Taiwanese teachers' acceptance of new practices of ICT integration. In Chou's studies, the teachers' desire for colleagues' approval in the social system within their workplace was proved to be one of teachers' underlying reasons for accepting and getting involved in whole-school pedagogical innovations in ICT integration. Therefore, supporting Ajzen's assumptions, Chou concluded that subjective norms embedded in teachers' workplace were highly likely to affect teachers' intentions to engage in the change process of implementing ICT.

Venkatesh et al., (2003) suggest that social influences are 'more likely to be salient to older workers, particularly women, and even then during early stages of experience/adoption' (p. 469). However, knowing these contingencies cannot help much in explaining the equivocal results reported in the literature. We need to understand why social influences only work for some people but not for others.

Most importantly, the extent to which subjective norms affect individuals' intentions of ICT adoption may rely on individuals' ICT background (e.g., ICT-related experiences, knowledge and skills). For example, Taylor & Todd (1995) explored individuals'

acceptance of new technologies in school settings. Their findings showed that subjective norms had a significant impact on individuals' intentions of ICT adoption. More than this though, the effect of subjective norms on intention was more influential to individuals without prior experiences in ICT and less influential to those with ICT-related experiences (Taylor & Todd, 1995). The different impact of subjective norms on individuals with different ICT-related experiences in Taylor and Todd's research (1995) seems to echo Hartwick and Barki's arguments (1994) that individuals with very limited ICT-related experience tended to form their intentions of ICT adoption by counting on others' opinions and reactions. Even so, individuals' sufficient ICT-related experiences may attenuate the effect of subjective norms on their intentions to use ICT. In this sense, when university changes regarding ICT development are under way, the necessary pressure put on the staff seems to be essential and important in the change process. Despite this, however, it is equally or even more important to offer the staff the adequate support for enhancing teachers' ICT-integrated pedagogical skills. By giving the required pressure and suitable support, it is highly likely to promote teachers' intentions of taking action for supporting ICT implementation.

However, some other research studies found no relationship between Social Influence and ICT usage. For example, Kumar et al. (2008c) in their study among some Secondary school teachers in Malaysia found no significant relationship between subjective norm and actual use of computers. In the same vein, Teo & Van Schaik (2009) in an empirical study included subjective norm as an additional variable within the TAM to assess its influence on intention to use technology by the preservice teachers of Singapore. The study found that subjective norm had no significant influence on perceived usefulness or on attitude towards computer or on behavior intention to use computer. Similarly, Ma et al., (2005) in their study among student teachers in Sweden observed that subjective norm did not have any direct or indirect effect on their intention to use computers.

Furthermore, Chang et al., (2011) conducted a study among some Professors teaching at Public and Private Universities in Taiwan. The results of the study showed that the subjective norm was a non-significant factor in user acceptance of an overhead projector, suggesting that teachers are not influenced by their colleagues' opinions or suggestions.

Although evidence for the influence of social factors on teacher use of ICT is supported in literature, further examinations of the influence on a theoretical basis is required since increased understanding would help in building better social support for teacher use of ICT at the level of Higher Education Institutions. Therefore, the construct of social factors is introduced in our current research to take consideration of both in and out of university ICT usage.

In summary, the influence of colleagues, University management and significant others defined as social influence (subjective norm) is either minimal or non-existent in determining the user acceptance and adoption of technology. This is true in case of voluntary setting, but may exert some influence on perceived usefulness and intention to use technology in mandatory working conditions, where the views of others would be more important.

Most of the above studies confirm that subjective norms are usually important for shaping individuals' intentions of accepting or rejecting ICT-related innovations. Thus, in this research, Social Influence was explored in order to answer the question: ***To what extent and why does Social Influence explain variances in the behavioural intention to use Information Technologies by Algerian University teachers in general, and more specifically at the University of Chlef?***

1.5.5. Facilitating Conditions (FC)

Facilitating Conditions (FC) are defined as external environmental factors that are likely to exert an influence on individuals' decision or desire to perform a task (Tarhini et al., 2017). In the context of Universities, various factors are identified that would probably work either as facilitators or as barriers of user acceptance of technology. It includes technical support, adequate technology equipment and software, support from colleagues and University administration. This definition captures concepts embodied by three different constructs: compatibility from IDT, facilitating conditions from MPCU, and perceived behavioural control from C-TAM-TPB and TPB/DTPB (Bhatiasevi, 2016; Venkatesh et al., 2003). In the context of Information Systems, support provided for PC users can be considered as an aspect of FC as it can affect the use of the system (Venkatesh et al., 2003). Many studies have suggested that facilitating conditions affect use, either directly or through Behavioural Intention (Taylor & Todd, 1995).

University environment, digital content, infrastructure, and equipment are considered facilitating conditions that affect the usage of technology in the learning environment. University environment includes the emotional, academic, and social contexts of University and how this is perceived by the students, staff, and teachers. The whole climate is affected by a wide range of factors ranging from disciplinary procedures to the quality of instruction by teachers and student morale. A University environment that is positive will very probably create the most favourable setting for learning and teaching. Moreover, it is indicated that University could be a supportive environment for teachers, both academically and emotionally, especially in the case of crisis or transition such as the unexpected closure of Schools and Universities with the spread of COVID-19. In order to support digital content, the school's infrastructure arguably needs an international Internet bandwidth, secure Internet servers and reliable production of electricity in addition to the digital content's accessibility (Dutta & Benat, 2012). Therefore, studies related to the effect of end users' perception of facilitating conditions in acceptance and use of technology at Universities are reviewed here. It is assumed that efficient and effective use of technology at Universities depends largely on the availability of hardware and software, and the equity of access to resources by teachers and students.

Mumtaz (2000) in the review of literature on factors affecting the use of ICT in the classroom reported that near absence or lack of access to resources, quality of software and hardware, ease of use, incentives to change, support in the school, school and national policies, and formal computer training as main obstacles in using technology. Butler & Sellbom (2002) investigated the barriers to technology use and found that unreliability of technology and limited technical support as problems for technology use.

Teo & Van Schaik (2009) in their study among pre-service teachers in Singapore based on technology acceptance model found that facilitating conditions influence perceived ease of use. The availability of guidance and specialised instruction to use computers had a positive impact on teachers' perceived ease of use of computers. Similarly, Mwalongo (2011) conducted a study among 74 teachers in Tanzania. The study had made a qualitative analysis of the effect of teachers' perception of facilitating conditions such as access, training, competence and ICT resources on teachers' use of ICT. The results have shown

that the frequency of use of ICT resources is influenced by access and competence of use influenced by training.

Additionally, Venkatesh et al., (2003) suggest that the influence of facilitating conditions on usage is moderated by age and experience of the individual in the UTAUT model. However, knowing these contingencies cannot help much in providing any meaningful guidance to implementation practices. In their study of technology acceptance among academic staff at Aljouf University in Saudi Arabia, Alkhasawneh & Alanazy (2015) found that FC related positively to behavioural intention in that staff members who perceived there to be a good organisational and technical infrastructure to support the system were more likely to say they would use it. However, there was no significant difference between male and female staff or among the different age groups in their sample. The authors concluded that the impact of the moderating factors of gender and age lessened as technology becomes more generally used by both genders and all ages, especially in an academic group such as University teachers who are likely to be familiar with new technologies.

Pynoo et al., (2011) conducted a study among 90 Secondary School teachers in Belgium using UTAUT as the base model to analyse the teachers' acceptance and actual use of digital learning environment. The results of the study showed a weak relationship between facilitating conditions and the actual use. The authors have found that facilitating conditions have only an indirect effect on user acceptance mediated through usefulness and ease of use.

In a Western educational context, Khechine et al., (2014) in an empirical research looked at the acceptance of the use of webinars among students at Laval University, in Quebec, Canada. They reported that although Facilitating Conditions (technical and organisational support) directly impacted on the students' intention to use the webinars, gender was not significant. Interestingly, age seemed to make a difference in that older students were more concerned about Facilitating Conditions and were more likely to stress the importance of support. Whereas in younger students, Performance Expectancy had a bigger impact on intention to use. The authors suggest that the age of users could be taken into account when assessing the needs of users. Likewise, Khasawneh (2015) carried out a study to examine the potential prominent factors related to the usage of ICT among some

of the academic staff in the Jordanian Public Universities. The findings showed that self-efficacy (SE), and facilitating condition (FC) positively affected the Behavioural Intention (BI) to use ICT in the Higher educational system among academic staff.

In a more recent study conducted on the teaching staff of the Eastern Province of Saudi Arabia, Khan and Qudrat-ullah (2021) assessed the predictors and moderators of the proposed UTAUT model that influenced the adoption and the use of Learning Management System (LMS) technology among teachers in the Higher Education Institutions (HEIs). The findings showed that facilitating conditions (FC) and availability of resources were the most significant predictors influencing the teachers' behavioural intention to adopt the LMS. The lack of required resources and facilitating conditions for teachers act as a barrier and demotivated from using LMS in HEIs. Therefore, we may say that management needs to consider providing all necessary technical support and facilitating conditions, such as offering training workshops on LMS.

However, many other empirical studies found the Facilitating Conditions to be non-significant (Karahanna & Straub, 1999; Gallivan, Spitler, & Koufaris, 2005). For instance, Gallivan et al., (2005) found no evidence to support the relation between facilitating conditions (such as training) and technology usage. Karahanna & Straub (1999) reported that 'surprisingly, facilitating conditions such as the availability of training and support for the use of information technology had no impact on perceptions of ease of use or usefulness of E-mail' (p. 1999). In the same vein, Thompson, Higgins, and Howell (1991) and Igbaria, Zinatelli, Cragg, and Cavaye (1997) also found a non-significant relation between usage and the facilitating conditions such as training and technical support.

According to Venkatesh et al.(2003), the UTAUT model does not show the impact of Facilitating Conditions on Behavioural Intention as it is assumed not to be significant when including Performance Expectancy and Effort Expectancy. Hence, the first change that we make to tailor the basic model of UTAUT to the teacher technology use context is the addition of a direct relationship from facilitating conditions to behavioral intention over and above the existing relationship between facilitating conditions and technology use. This is based on theoretical foundations(Ajzen, 1991; Taylor & Todd, 1995) and empirical findings (Botero et al., 2018; Jairak, Praneetpolgrang, & Mekhabunchakij, 2009; Shah et al., 2020) that support the effect of both facilitating conditions and behavioural intention

that have a comparable positive influence on actual use behavior even in the presence of effort expectancy – in contrast to original model. In UTAUT, facilitating conditions is hypothesized to influence technology use directly based on the idea that in an organizational environment, facilitating conditions can serve as the proxy for *actual behavioral control* and influence behavior directly(Ajzen, 1991). Thomas *et al.* (2013) cite some studies that confirm this point (Al-Gahtani et al., 2007; Im et al., 2011; Nassuora, 2012; Wang & Shih, 2009), but mention that Jairak et al., (2009) note a positive effect of Facilitating Conditions on Behavioural Intention. Although the UTAUT model suggests that Facilitating Conditions do not affect Behavioural Intention, FC could well become a key predictor of Behavioural Intention whenever there are constraints on resources. Thus, in this context facilitating conditions will act more like perceived behavioural control in the Theory of Planned Behavior and influence intention (Ajzen, 1991; Venkatesh et al., 2012). This is why in the context of this study, as Venkatesh et al. (2012), we follow the general Theory of Planned Behavior model and link facilitating conditions to behavioral intention.

From the above discussions, one can assume that Facilitating Conditions such as access to computers, support from colleagues and faculty administration, training and technical support in the use of ICTs are found to influence the use of Information Technology. However, studies have confirmed that the influence of Facilitating Conditions is mostly mediated through usefulness and ease of use – i.e., performance expectancy and effort expectancy respectively in the original UTAUT model. Consequently, in this research, Facilitating Conditions was explored in order to answer the question: To what extent do Facilitating Conditions influence teachers' behavioural intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?

However, the current research study has a different standpoint from other studies conducted in the field of Information Technology, because we believe that the construct of '*attitudes*' has a major influence on individuals' behavioural intention to use ICT in their teaching practices. Hence, it is proposed to alter the original model of UTAUT by adding the individual characteristic of '*Attitude Toward Using Technology*', as the extant literature developed by scholars such as Altalhi, 2020, Dwivedi et al., 2019, García Botero et al., 2018, and Šumak & Šorgo, 2016 and the experience of the researcher of the current study

who has identified that this element appears more appropriate for the Algerian educational context (Makhlouf & Bensafi, 2021). The revised model is designed to allow for a fuller analysis of the acceptance and use of new educational technologies by Algerian University teachers and to answer the research questions and hypotheses.

Although teachers' attitudes play a major role in the incorporation of ICT in their classes, there are few studies examining University teachers' attitudes towards use of ICT in Education. Thus, there is a need for further studies to examine teachers' attitudes towards ICT use in Higher Education. In view of this gap, one of the main objective of this research is to examine the impact of *attitudes towards using technology* on University EFL teachers' behavioural intention for the acceptance and usage of ICT in their teaching practices in classrooms.

1.5.6. Attitude Towards Using Technology (ATUT)

Any initiatives of technology use at the level of Higher Education depend strongly on the support and attitudes of teachers involved. Hence, it is difficult to describe attitudes in unequivocal terms considering the myriad of ways they have been defined in the literature. Ajzen (2006b) described *attitude* as a predisposition to respond favourably or unfavourably to an object, person, or event. Eagly and Chaiken (1993 as cited in Haddock & Maio (2004, p. 276), in what is perhaps the most widely used modern definition, describe an *attitude* as '*a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour*'. Based on one interpretation of Eagly and Chaiken's (1993) definition, Lord (2004) claimed that attitudes are sets of evaluative responses, including thoughts, feelings, and actions toward an attitude object that have a tendency to be either favourable or unfavourable. An individual might have an overall positive attitude toward an attitude object and still have a mixture of thoughts, feelings, and actions, some of which are positive, some neutral, and possibly a few that are slightly negative. According to Licence (2019), attitude 'is the individual's positive or negative evaluation of using the educational technology'. Hence, in the context of the current study, the construct of '*Attitude toward Using Technology*' refers to an individual's overall affective reaction to using ICT, as a key mediator. This construct is closely related with four constructs in the existing models: attitude toward behaviour (TRA, TPB/DTPB, C-TAM-TPB), intrinsic motivation (MM), affect toward use (MPCU), and affect (SCT). Consequently, measuring

ICT attitudes can be seen as an evaluation whereby individuals respond favourably or unfavourably to ICT use. Thus, positive attitudes toward ICT are expected to foster ICT use in the classroom. Rightly, concerning the direct relationship between attitudes and behaviour, Figure (1.13) shows a diagrammatic illustration of the attitude – intention relationship, followed by the attitude – behaviour relationship and finally the intention – behaviour relationship.
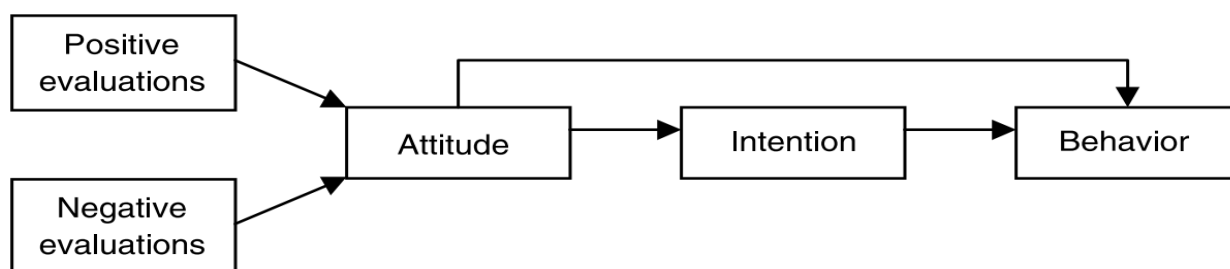
Figure 1.13 Attitude – intention – behaviour model (Armitage & Conner, 2004).

In accordance with the accumulated theoretical and empirical research, the model in Figure 1.13 above shows that attitudes do not (necessarily) determine behaviour directly and that the effects of attitudes on behaviour can be mediated through behavioural intentions. In fact, Jonas et al., (1997, as cited in Armitage & Conner, 2004) regard behavioural intentions as being so closely related to behaviour that they use intentions as proxy measures of behaviour. Thus, it is necessary to consider variables through which attitudes affect behaviour.

Recently, there has been a growing body of research on the use of Information and Communication Technology (ICT) in the field of Education. This usage has spread all over the corners of the world, and particularly in the Arab world due to the several benefits of new technologies. However, teachers have different attitudes toward the usage of technology in Education; some agreeing with the use of ICT whilst others have misgivings (Zalah, 2018). Some teachers have these negative attitudes for several reasons: such as lack of confidence and skills in using the technology, the lack of educational training courses that support teachers to use ICT, and the lack of efficient pedagogical and technical support. Understanding attitudes and their influence on teachers is crucial. Besides, an exploration of teachers' attitudes will allow a better understanding of the extent to which they accept and use ICT in their teaching practices. It has been suggested by the researcher Shirvani (2014) that teachers need to go through a number of psychological stages during

the application of new technologies and that teachers' concerns about these new technologies should be taken into account. There are three stages in the concerns that follow the introduction of a new technology: the stage that concerns the self, the stage concerned with task implementation and management, and the stage that takes into account the effects of using technology on students.

One of the greatest social changes that this modern era has witnessed is arguably the ones made by Information and Communication Technology, notably, the Internet, which can transport an enormous range of data instantly and easily into homes, workplaces and Educational Institutions, so deserve to be considered one of the top innovations of the last three decades. The Internet can function as a great library that can be used remotely and save time. However, some people have challenged the role of this changing technology and are resistant to using this technology in general and the Internet in particular (Koksal, 2013). Individual users can exhibit a variety of behaviours when confronted with a new Information Technology. As Agarwal (2000 as cited in Keller (2011), a leading information systems researcher, puts it rightly:

> *They may completely reject it and engage in sabotage or active resistance, they may only partially utilize its functionality, or they may wholeheartedly embrace the technology and the opportunities it offers. (Agarwal, 2000, p. 86)*

Accordingly, research evidence on technology acceptance often includes: (1) determining the factors that cause individuals to completely accept or reject new Information Technology, or engage in sabotage or active resistance; (2) designing appropriate implementation tactics and interventions that mitigate problems associated with the rejection of Information Technologies; and, (3) identifying factors that ensure continual use of Information Technologies (Teo & Van Schaik, 2009). Therefore, the problem of individual acceptance of Information Technology is crucial for teachers and students. To predict and explain user acceptance, it is necessary to understand why people accept or reject new Information or Communication Technology (Davis et al., 1989; Oye et al., 2011). Technology acceptance theories, particularly the 'Unified Theory of Acceptance and Use of Technology' (i.e., UTAUT), are considered the most influential and commonly applied theories for describing individual user acceptance of information systems. The rationale behind the selection and the use of the UTAUT model in the current research is inspired by its wide applicability, excellent explanatory and comprehensiveness

power (as more than 70%) than other models of technology acceptance (Khan & Qudrat-ullah, 2021; Sultana, 2020).

Educational technologists play a pivotal role for fostering and implementing the acceptance and adoption of innovative devices and programmes to enhance the processes of teaching and learning. Undeniably, educational technology and its aim to improve teaching have developed more rapidly than its acceptance and use in the classroom, and teacher resistance is considered one of the factors that influence the acceptance of ICT. Hence, understanding teachers' resistance to change will be very significant in an analysis of technology acceptance (Parlakkılıç, 2014).

Achieving a meaningful use of computer technology in the field of education can be influenced by many factors. One of these factors is teachers' attitudes towards the use of technology in teaching and learning process. A multitude of research studies shows that the success of technology use in the educational settings largely depends on the attitudes of teachers toward technology use, who eventually determine how ICT is used in the classroom (Botero et al., 2018; Tarhini et al., 2017). Teachers' attitudes are considered as a major predictor of the use of new technologies in the educational contexts as teachers directly impact the learning and teaching processes substantially (Albirini, 2006; Padmavathi, 2014). Thus, teachers' attitudes toward ICT can play an important role in the acceptance and actual use of computers. When Universities promote ICT use, they need to understand their teachers' and students' attitudes towards its use (Mahdizadeh et al., 2008).

Correspondingly, a number of empirical studies were carried out to determine teacher attitudes towards using technology in teaching practices (Harrison & Rainer, 1992; Myers & Halpin, 2002; Usun, 2009; Wario, 2014; Birkollu, Yucesoy, Baglama, & Kanbul, 2017; Bouchefra & Baghoussi, 2017; Laabidi, 2017; Bouaricha & Hamzaoui, 2021; Makhlouf & Bensafi, 2021). For instance, Harrison and Rainer (1992) conducted their research using data compiled from a 1990 survey of 776 knowledge and information workers from a large University in the Southern United States. They found that participants with negative computer attitudes were less skilled in computer use and were therefore less likely to accept and adapt to technology than those with positive attitudes. In the same vein, Wario (2014) carried out a study at a rural South African University. He stated that for academic staff members to enthusiastically engage in ICT integration, they must not only have adequate

and quality resources and unhindered access, but they also need to have a positive attitude towards ICT use in the classroom. They (academic staff) need to understand and value the benefits of ICT integration. There is no point in spending huge amounts of money on buying computers if staff members do not understand 'why' they should use them. Similarly, in the neighbouring country of Algeria, the researcher Laabidi (2017) examined the attitudes of Moroccan Professors of English toward the use of computers in teaching practices on the basis of four components: anxiety, confidence, liking and usefulness. The findings revealed that Moroccan Professors of English language possesses positive attitudes toward the use of computer technologies in teaching environments.

In a recent sequential mixed methods study in Algeria, Makhlouf and Bensafi (2021) carried out a study to explore the attitudes of Secondary School EFL teachers in the Western District of Chlef toward ICT use in Algeria. The findings from both the questionnaire and interview data unravelled that EFL teachers demonstrated positive attitudes toward the use of ICT in their teaching practices. Similarly, earlier, Bouchefra and Baghoussi (2017) conducted a study to investigate the attitudes of EFL University teachers towards Computer Assisted Language Learning (CALL) at Djilali Liabes University in Sidi Bel Abbes. The results showed the informants demonstrated a clearly positive attitude towards CALL and manifested a number of signs that indicate their preparedness to actively engage in any CALL in the future if circumstances are favourable. Furthermore, Bouaricha and Hamzaoui (2021) investigated the attitudes of 12 EAP teachers towards the Use of Information Communication Technologies in the teaching of English for Academic Purposes (EAP) from three Departments at the University of Tlemcen in the West of Algeria: Industrial Engineering (IE), Computer science (CS) and Finance. The researchers adopted the Technology Acceptance Model (TAM) in order to demonstrate the perceived ease of use and the perceived usefulness of ICTs among EAP teachers. Two research instruments were used: questionnaires with 12 teachers and ninety students and classroom observations. The findings showed that most teachers had positive perceived usefulness of ICTs.

Based on a critical review of the Unified Theory of Acceptance and Use of Technology (UTAUT), Dwivedi, Rana, Jeyaraj, Clement & Williams (Dwivedi et al., 2019) found that attitude played a central role in the acceptance and use of IS/IT innovations. More

specifically: a) attitude was also influenced by facilitating conditions and social influence, b) attitude had a direct effect on behavioural intention, which implies that attitude partially mediated the effects of performance expectancy, effort expectancy, facilitating conditions, and social influence, and c) by attitude exerted a direct influence on usage behaviour. These findings are crucial since they underscore the importance of explicitly modelling individual characteristics in theories of IS/IT acceptance and use. In general, teachers' attitudes seems to influence their use of ICT. Several factors could affect teachers' attitudes such as home use, in-service training and access to ICT resources. All of these factors work together to change teachers' attitudes to be more positive towards ICT use. Thus, the availability of ICT equipment does not in itself guarantee its effective use in the classroom, but the attitude of teachers, whether positive or negative towards ICT, is an influential factor in its integration process (Wario,2014).

The evidence from research into the effects of teachers' attitudes on ICT uptake and use discussed above clearly indicates that teachers' uses of ICT will also be affected by their perceptions of the pedagogical practices required to integrate ICT appropriately in their teaching. We can assume that attitude is determined largely by perceived usefulness and to a lesser extent by ease of use. In turn, attitude has an effect on intention to use. The attitude of end-user of technology is found to be influenced by computer training (Padmavathi,2017). Gender and age had mixed results in influencing the attitude, although, younger age group seemed to have a positive attitude towards the use of technology at universities. The foregoing review of the literature suggests that, in general, teachers' attitudes towards ICT are mainly positive and their positive perceptions increase as years pass. However, there are still a considerable number of teachers who are still hesitant, reluctant, and anxious about ICT use in their teaching practices.

Based on the results from the studies described above, it seems possible to conclude that there is a strong positive relationship between teachers' attitudes and '*the behavioural intention*' and '*actual use*' of technology. Hence, the concept of '*attitude*' held great promise for the prediction of behaviour in the current research (Vargas, 2004). Teachers' perceptions and attitudes need to be taken into consideration for a successful large-scale adoption of ICT in Higher Education Institutions. Therefore, there is a pressing need for further studies to examine teachers' attitudes towards ICT acceptance and use in Higher

Education. In view of this gap, one of the main objectives of this research is to examine the influence of University teachers' attitudes towards Technology on the Behavioural Intention to ICT use in EFL classrooms in terms of different moderating variables (e.g. age, gender, and teaching experience). Framed by this aim, Teachers' Attitudes Towards using Technology (ATUT) was explored in the current research in order to answer the question: *To what extent does Attitudes Towards Using Technology influence teachers' behavioural intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?*

1.5.7. Behavioural Intention (BI)

Behavioral intention is defined as people's decisions to perform particular behaviours and represent a summary of people's motivation to act: the more an individual *intends* to do something, the more likely that behaviour is to be performed (Armitage & Conner, 2004). Behavioural Intention to use technology (BI) is defined as a user's intention to adopt and make use of a certain tool in the future (Venkatesh et al., 2003). The notion of behavioural intention obviously plays a major role in theories of (TAM) and (UTAUT) presented by researchers Davis (1989) and Venkatesh et al., (2003), respectively; thus, it is considered the most significant determinant that mediates the relationship between the predictors and ICT usage (Mousa Jaradat & Al Rababaa, 2013; Shah et al., 2020). The behavioural intention has been extensively used in all the prior literature on technology acceptance and use (Nasiru Yakubu & Dasuki, 2019; Hu et al., 2020; Khan & Qudrat-ullah, 2021). Most of the examined studies on the acceptance of technology are based on the *behavioural intention* of an individual to use technology as the dependent variable. A number of independent variables are used to determine their direct and indirect effect of intention to use, which includes: 'Performed Expectancy', called perceived usefulness, 'Effort Expectancy' called perceived ease of use, 'Social Influence', 'Facilitating Conditions', and 'Attitude Towards Using Technology'. Apart from these key independent variables, other moderating variables of importance that mediate its effect on intention to use technology include socio-demographic characteristics such as gender, age, prior computer training, years of computer experience, and teaching experience.

Also, previous studies on the effect of social influence (subjective norm) on intention to use had produced mixed results. The effect of social influence found to be (a) moderately

significant in the early stages of training and adoption of technology; (b) started diminishing with increase in technology experience (e.g., Hu et al., 2003; Teo, Lee & Chai,2008; Teo et al., 2008; Lee et al., 2010). However, some other studies have shown that (a) social influence had no direct effect on their intention to use computers; (b) social influence had no mediating or indirect effect on intention to use computers through any of the key determinants of technology acceptance model; (c) the non-existence of effect of social influence on intention to use is truer in case voluntary as against mandatory setting of technology use (Ataran & Nami, 2011; Chang et al., 2011).

Conversely, a number of past researchers show that (a) performance expectancy factor impacts significantly the behavioural intention of people to adopt and accept ICT; (b) effort expectancy (perceived ease of use) has only moderate and indirect effect on intention to use ICTs; (c) attitudes toward using technology influences behavioural intention (d) social influence and facilitating conditions have only limited moderating effect on intention to use through perceived usefulness. Hence, Behavioural Intention is considered the most significant determinant of the individuals' behaviour use, and the intention of teachers to carry out behaviour is a mixture of subjective norms and attitude towards performance. The researchers Moghavvemi, Salleh, and Abessi (2013) in a study carried out in the Klang Valley within Malaysia point out that the UTAUT model does not assess the factors involved in the relationship between Behavioural Intention and actual use. Indeed, there is a difference between teachers stating that they intend to use Information Technologies and actually doing so. The study conducted by Azjen *et al* (2004) reveals that there is a strong possibility that people 'overestimate the likelihood that they will engage in a socially desirable behaviour'. They suggest overcoming this difficulty by using a 'corrective entreaty' which indicates the importance of correctly assessing BI. In the context of the current research, the 'corrective entreaty' can be said to be the covering letter which urges informants to say what they really mean. Also, through the interviews one can check on the relationship between Behavioural Intention and actual use. Therefore, the effectiveness of the corrective entreaty has important implications for influence of intentions on behaviour (Ajzen et al., 2004, p. 1119).

In the original UTAUT model, all the three exogenous factors (Performance Expectancy, Effort Expectancy, and Social Influence) affect Behavioural Intention with

only Facilitating Conditions directly affecting actual use. A fundamental concept behind adoption is that the '*intention*' of a person to adopt new technology is the prediction of its '*actual usage*'(Khan & Qudrat-ullah, 2021). A review of the literature shows that the 'intention to use' a technology is highly correlated with the 'actual use' of the technology (Shiau & Chau, 2016).

From all of the above-mentioned presentation, it is concluded in this study that behavioural intention significantly mediates the relationship between ICT use and among the dimensions of UTAUT. As an important variable of the UTAUT model is represented by the behavioural intention, the current study has also been interested in seeing if the behavioural intention could be translated into the actual use of Information and Communication Technologies in teaching practices. Hence, it is essential to investigate the determinants that influence teachers' behavioural intentions to use ICT in the classroom at Algerian Higher Education Institutions (AHEIs).

Put it in a nutshell, in this study Behavioural Intention was explored in order to answer the question: *To what extent does Behavioural Intention influence teachers' actual use of ICT in the Algerian Higher Education Institutions (HEIs)?*

1.6. Barriers to the Adoption of ICT in Teaching

Having discussed supporting factors, it is important here to consider hindrances to ICT use in classroom practice. In the present study, the terms 'hindrance' 'obstacle' and 'barrier' are used interchangeably. Indeed, there are many factors that act as hindrances to teachers' use of ICT, thus affecting their motivation to practise teaching with it. Several researchers and scholars classified barriers to ICT use into two types: the internal or second-order barriers, and the external or first-order barriers (Ertmer, 1999; Rogers, 2000; Snoeyink & Ertmer, 2001). For instance, Rogers (2000) defined internal barriers as the ones related to teachers' attitudes and perceptions towards ICT in addition to their competency with ICT, whereas external barriers are related to the availability and accessibility of hardware and software, technical support, management support, and continuous training programmes. However, there are some barriers that may be viewed as both internal and external, for example, lack of time.

Regarding internal hindrances, Scrimshaw (2004) later offered four possible explanations for teachers not using ICT:

- Existence of teachers' views about ICT as being incompatible with their wider educational beliefs.
- Existence of obstacles associated with personal characteristics of teachers, such as lack of computer skills.
- Existence of social obstacles to increase the level of ICT uptake, such as lack of support from colleagues.
- Existence of obstacles in school to expand ICT use, such as lack of technical support.

In addition to the theoretical exploration on the key determinants of ICT acceptance and use, a rich body of empirical research has specifically focused on barriers to ICT adoption (e.g. Percy & Van Belle, 2012;Laabidi & Laabidi, 2016; Asnawi, Yunisrina, & Rena, 2018). For the current study, such a literature review would facilitate in identifying key barriers of the acceptance and usage of ICT among the university teachers. For instance, Rogers (1999 as cited in Al Senaidi, 2009) interviewed 28 college and university teachers in Minnesota and found the four top barriers were the lack of funds specified for technology-related needs, the lack of sharing best practices across systems, the need of technical support staff, and the need for release time and time for training faculty and staff.

Pelgrum (2001) outlined four material obstacles and six non-material obstacles to ICT implementation. Among the material obstacles were insufficient numbers of computers, insufficient peripherals, not enough copies of software, and insufficient numbers of Internet-ready computers. The non-material obstacles were teachers' lack of knowledge and skills regarding ICT, difficulties in integrating ICT in instruction, difficulties in scheduling enough time for students to use computers, insufficient time for teachers to learn or practise ways to use computers, lack of supervisory staff, and lack of technical staff. Further, teachers can neither learn computer skills nor integrate ICT into curricula without having good access to computers. According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. Teachers' lack of knowledge and skills is one of the main hindrances to the use of ICT in education both for the developed and underdeveloped countries.

Investigating a sample of 125 faculty members in the College of Sciences and Humanities at Ball State University, the researchers Butler and Sellbom (2002) found that

the major factors affecting ICT adoption were technology reliability, learning to use new technologies, uncertainty about its worth, and the lack of institutional support. After interviewing 24 lead faculty members at the University of Southern Colorado, Ebersole and Vorndam (2003) concluded that the top leading barriers to adoption of educational technology were time, resources, and a lack of confidence in the benefit of educational technology.

Sharma (2003) states that the most notable of the barriers to the use of ICT in education in developing countries seems to be the political will of the people in the corridors of power. The allocation of sufficient funds for the educational sector and ICT does not seem to be very attractive to the leaders. If the political leaders favour the technology, it will bloom.

Jones (2004) wrote a report on the results of Becta's online survey of 170 educational practitioners regarding their perceived barriers to the use of ICT. The report outlined a number of barriers to the uptake of ICT that were grouped into teacher-level barriers and school-level barriers. The teacher-level barriers were related to teachers' (1) personal deficiencies, such as lack of confidence, and lack of competence (due to lack of time for training, lack of pedagogical training, lack of skills training, and lack of ICT focus in initial teacher training); (2) resistance to change and negative attitudes; (3) anxiety; (4) inequalities, such as age and gender differences; and (5) lack of perceptions of benefits of ICT use. School level barriers were identified as: (1) lack of time scheduled by schools for teachers to use ICT, (2) lack of access to resources (due to lack of hardware, poor organisation of resources, poor quality of hardware, inappropriate hardware, lack of teachers" personal access to ICT resources); (3) technical problems (fear of things going wrong, lack of technical support); and (4) impact of public examinations. The Becta study indicated that there were interrelationships between each of the identified barriers to ICT use. For example, teachers' confidence was directly affected by other barriers such as personal access to ICT, availability of technical support, and the amount of training. Figure 1.14 aims to illustrate these relationships.
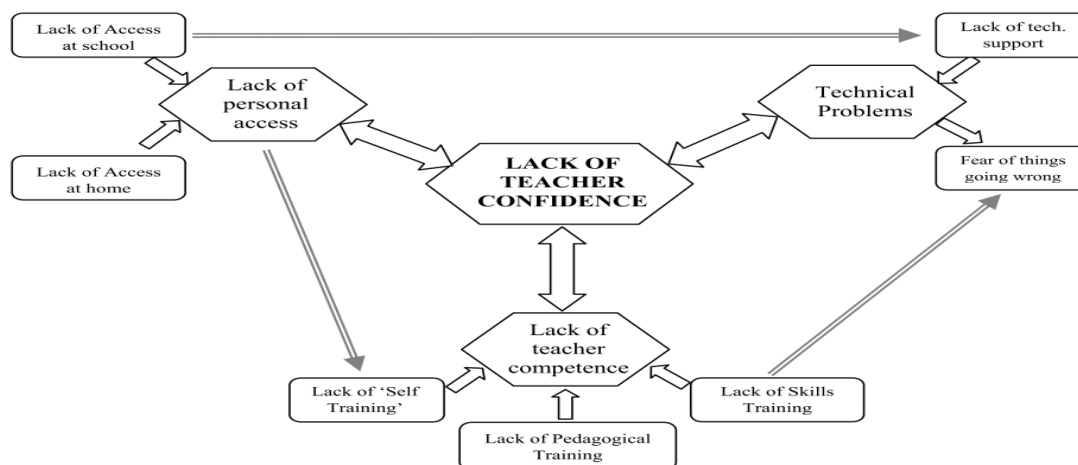
Figure 1.14 Relationships between Confidence barrier and other barriers (Jones, 2004, p. 22).

In Figure 1.14, the direction of the arrows represents the phrase, '*can lead to*'. For example, a lack of technical support can lead to technical problems, which can in turn lead to a lack of teacher confidence. The double-headed arrows show that confidence can be influenced by the three related barriers, but in turn, a lack of confidence could itself magnify the effects of these three barriers. For example, teachers with low confidence may have a higher expectation of technical faults occurring if they were to use ICT, and as a result may avoid using it. Secondly, a teacher with low ICT confidence may choose not to take part in any optional training, perhaps through fear of embarrassment in front of colleagues, and as a result their competence in using ICT will not improve. Thirdly, a teacher with low confidence may avoid seeking out facilities for personal access to ICT, which would as a result magnify the effects of this barrier.

In Malaysian Universities, Wee and Zaitun (2006) found that the rapid growth of technologies without having a sufficient time and effort being spent to understand the technologies is considered as one of the obstacles of the new technologies. They also found that the lack of network connectivity and lack of management support and encouragement for the academic staff to use the technologies in their teaching and learning process hinder the adoption and integration of technologies in the educational system.

Additionally, Funde and Dhondge (2011, as cited in Padmavathi, 2014) conducted a study among student teachers who were pursuing a diploma in teacher education programme and teacher educators to elucidate their views on integrating ICT into teacher training. The study indicates that the informants have shown a strong desire for the

integration of ICT into teacher education but they encountered many barriers to it. The major barriers of ICT integration into teacher training as reported by the student teachers include: lack of training, lack of confidence and competency, lack of access to computers in practice teaching schools, lack of motivation among teacher educators and negative attitude of teacher educators in using ICT for practice teaching.

Although the studies reviewed above used different terms such as material/nonmaterial obstacles, and teacher/school level internal/external barriers, the main obstacles or barriers to ICT use appear to be common across countries, and the obstacles or barriers are interrelated. Therefore, these barriers or obstacles, if not addressed, can have a profound influence on the integration of ICT in the classroom practice.

Based on various standpoints and varied literal perspectives from different researchers identified in the literature, this study discovered insightful findings. The researcher of this study identified a gap in the insights provided in the literature and attempted to fill this gap through the current study. Therefore, the researcher focused on developing an understanding of the factors influencing EFL teachers' use ICT in their teaching practice. Consequently, this presented a crucial linkage that the researcher identified as missing especially in the Algerian Higher Education Institutions.

The review of literature clearly exhibits the necessity to carry out research on technology acceptance in the field of Higher Education, more specifically among EFL University Teachers in Algeria, since such studies are limited or non-existent. Research studies that analyse the role of Performance Expectancy, Effort of Expectancy, Social Influence, Facilitating Conditions, and Attitudes Towards Using Technology in influencing teachers' behavioural intention and actual use of ICT in EFL classrooms in Algeria is found to be the need of the hour. Furthermore, research studies to understand key determinants of teachers' intention to use and actual use of ICT are of paramount importance for the successful integration of technology as a pedagogical tool in the Algerian Higher Education Institutions. It is equally important to include various socio-demographic characteristics of teachers (mainly age, gender, and experience) to assess their impact on teachers' acceptance and use of technology at the Algerian Universities. The institutions are lagging behind in the use of available technology, and the research has found serious obstacles to fully integrate technology into educational processes.

Conclusion

In this chapter a theoretical background for the study was presented. This background started by defining the term ICT as used in various educational contexts. In order to build on key previous studies, the literature discussed briefly the historical evolution of ICT in Education and explained the concept of technology acceptance. The literature addressed some of the main theories of ICT acceptance and use, and provided evidence from the previous studies how these theories played a critical role in exploring the main determinants of technology use in classroom practice. This chapter also covered the theoretical framework upon which the study was based. Closer examination of studies using Venkatesh et al.'s Unified Theory of Acceptance and Use of Technology (2003) revealed that this framework had been used extensively to test the acceptance and use of ICT in developed countries, but that more work was needed on its application to developing countries such as Algeria.

The Unified Theory of Acceptance and Use of Technology (UTAUT) and the eight preceding models on which it is based have been examined with a view to adopting the UTAUT to a specific context, namely the Algerian Higher Education. The study of technology acceptance in the Algerian education system has been largely restricted to an exploration of Secondary Education, and there needs to be further research into the current situation in the Algerian Higher Education Institutions. A review of the literature, both in terms of technology acceptance theory in general, and in terms of the current situation with regards to the implementation of Information Technologies in Algeria in particular, has identified the need to apply a refined version of the UTAUT to explore the attitudes and needs of the Algerian University teachers for effective use of these technologies in their teaching practices. Thus, this study aims to fill this knowledge gap.

This Chapter has also covered the reviewing of the existing literature and provided insights from previous empirical and theoretical studies about the key psychological factors influencing particularly the EFL teachers' ICT use in education including Performance, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, among others. Therefore, seven hypotheses were postulated in the general introduction of this study. Some of these hypotheses are formulated for the purpose of drawing relationships that have been tested previously but need to be re-examined as a

result of introducing the new modified version of UTAUT model, modifications made to the measures, and because the new model is tested for the first time in the Algerian Higher Education context. This literature also drew views and results from different researchers who studied ICT use in Higher Education in the developing nations such as Nigeria, India, Malaysia, Jordan, Saudi Arabia, Morocco, and Algeria just to mention a few. The literature extensively covered the main challenges and barriers that might impede teachers from the use ICT. The next chapter will focus on the adoption and use of ICT within the context of the Algerian Higher Education System, precisely at the University of Chlef, Department of English.

Put it in a nutshell, this chapter has laid the foundation for the present research study. It has introduced the research problem and the questions to be investigated, that is the extent to which the psychological factors influence Algerian University teachers effectively use ICT in the classroom and the mediating role of socio-demographic variables that may affect this implementation. This research is significant due to the paucity of research in this area within the Algerian Higher Education context, specifically at Hassiba Ben Bouali University of Chlef.

The next chapter, Chapter 2, presents a description of the research setting. An overview of Algeria and some background of the Educational system in Algeria as well as some issues of ICT integration in teaching and learning process are provided and examined.

CHAPTER TWO
ICT AND THE EDUCATIONAL
SYSTEM IN ALGERIA

Introduction

As noted in the General Introduction, the study took place in Algeria. The research was conducted at Hassiba Benbouali University of Chlef, west of Algeria. This area was more accessible to us. Also, we had chosen informants to be solely from the Department of English in this area because they represent the context in which, and the people with whom, we are working and will be working as teachers.

This chapter intends to provide general information about ICT-use and Educational system in North Africa and then more specifically in Algeria. It is presented in three main sections. The first section discusses various ICT integration policies and initiatives in developing countries, North Africa and the Middle East (MENA), and the Arab region, as well as a review of some Arab World studies, before moving on to a discussion of Algeria's profile in terms of ICT adoption, primarily at the level of Higher Education Institutions. The second section focuses on the organisation of the Higher Education System of Algeria emphasising on reforms and governance. The final section of this chapter deals with a detailed examination of the challenges surrounding ICT integration and the reasons for teachers' effective use of ICT in classroom practices. Finally, this chapter concludes by addressing the gap and research questions of the study.

2.1. ICT Climate in Developing Countries

In recent years, developing countries have placed a greater emphasis on Information and Communication Technologies (ICTs). ICTs are critical enablers for several of the United Nations' Sustainable Development Goals, and universal access to ICTs remains a major challenge(Skouby et al., 2019).Computer technologies had attained wide recognition in technologically developed countries by the time they entered developing countries.As discussed in the existing literature in the field of using ICT in the Algerian Education, the new changes were often characterised by speed, convenience, and efficiency (Makhlouf, 2017) in this digital era. With these attributes, 'Computerisation has risen to ideological prominence, an expression of grand hopes and ideals' (Winner, 2003, p. 595). Unfortunately, however, the use of modern technological tools such as

computers and the Internet are still in its infancy stage in most developing countries (Ndibalema, 2014).

In terms of realisation of the potentials of Information and Communication Technology (ICT) in Education, many countries in the developing world, including the least developed countries, are making significant investments on developing their respective ICT in Education plans and on bringing various ICT equipment and resources into schools (Kozma & Vota, 2014; Zhang, Yang, Chang & Chang, 2016a). The use of ICT for education in developing countries has been a subject of a major concern and speculation, with its proponents arguing that ICT improves educational quality, develops critical thinking and problem-solving skills, expands access, increases economic competitiveness and facilitates inclusion in a rapidly expanding global Information Society (Shields, 2011).

Recently, there have been a series of systematic reviews published of national ICT policies in education; many of them include policies from developing countries. For instance, Farrell, Isaacs and Michael (2007) conducted a survey of the educational ICT policies in 53 African countries for the infoDev Program of the World Bank. These reports use a common analytic format to provide detailed descriptions of each nation's policy status. At the time of the report, 36 of the 53 countries had national ICT policies in place and 12 had policies under development. Only 5 of the 53 had no national ICT policy or no plans underway.39 of the countries had ICT policies and plans in the education sector in one form or another or were in the process of developing them. In a similar vein, another infoDev sponsored survey of educational ICT was conducted by Gaible (2009), who also used a common format to describe the policies and programs of 16 Caribbean countries.

In a recent book designed and presented in two volumes, Demiray et al. (2010a) systematically review e-LEARNING practices in education. The book covers in-depth case studies of policies and programs in 39 countries, using a common format across countries, similar to the format in the Farrell and Issacs' report. The thirty-nine countries are geographically in two wide swaths from North to South down the Eastern side of Europe, and then from West to East across Northern Africa into Central Asia, including Algeria.

Government spending on ICT implementation in developing countries is driven by a number of motives. Kozma (2008) identifies three most often used by governments to justify the use of ICT: economic development, social progress, and education reform. These motives are not mutually exclusive and are often mutually reinforcing. Many countries connect ICT policy to combinations of education reform, economic development or social development. For example, as one of the developing countries, Jordan as shown in several studies, combined ICT, education reform and economic development. However, there was often a logical gap between the policy rationale – be it economic, social, or educational – and the specifics of its implementation. It is not clear from the policy formulations how it is that investment in ICT will lead to economic prosperity or social progress. However, ICT has brought about major changes in the global economic climate which gives developed countries significant potential to achieve capital accumulation (Lahmar & Benzidane, 2019). The estimated Internet users worldwide are 1 billion in which Africans Internet users represent 11.5% only (Internet World Statistics, 2021).

Since ICT was introduced into Education, it has brought benefits to both developing countries and developed countries. For instance, it has facilitated the connecting of rural schools to the outside world and more internal and external communication through the Internet. However, a number of issues still remain unsolved. For example, although ICT use in education is an encouraging trend in the 21st century, it is still hard to use ICT freely and proficiently and teachers are facing obstacles in actually using computers in their teaching practices.

While citizens of developed countries, referred to as ICT-developed countries, are enjoying the benefits of digital revolution, citizens of developing and emerging countries referred to as ICT-emerging countries, are left behind which resulted in a huge gap between those two categories. This is widely referred to as the digital gap or the digital divide (Dhaou & Abdessemed, 2010). For example, the ICT divide within the MENA region is the largest among all regions. The UAE (23rd, moved up one) and Qatar (27th, moved down four) continue to lead, ahead of Bahrain (30th), KSA (35th), and Oman (42nd), which are all countries of the Arabian Peninsula (Alayyar, Aljeeran & Almodaires, 2018). In the rest of the MENA region, only Jordan (52nd) features in

the top half of the rankings. Morocco follows at a middling 78th, but it is the country that has improved the most (moved 21 places up) over the past year. Yemen (136th) remains the region's worst-performing country, 115 places behind the UAE. Algeria is also suffering from the digital gap that motivates further the Algerian Government to take precise steps to escape the digital gap and to gain full benefits from the digital technology (Dhaou & Abdessemed, 2010). Thus, the rapid evolution in ICT will make it harder for the developing countries to bridge the already-widening gap between the developed and developing world (Nour, 2002).

The rationales of implementing ICT in Education in developing countries include the use of educational ICT to support economic development, social progress, and education reform (see examples in Kozma & Vota, 2014). According to Zhang et al. (2016), the challenges of ICT in Education in most developing countries include: (1) *Affordability*: recurrent budget to ensure universal access to ICT devices and online digital resources, and regularly update ICT in education; (2) *Capacities*: in making and managing sector-wide ICT in education policies; institutional and individual capacities in executing policies; (3) *Inclusion*: equal opportunities for the economically and/or demographically disadvantaged populations; *(4) Content*: ICT facilitates and complicates the content development and dissemination at the same time.

When it comes to actually implementing the programs envisioned by ICT policies in Education, Kozma and Vota (2014) indicate there are a number of challenges faced by all governments but particularly those in developing countries. These challenges include:

- Deploying ICT infrastructure
- Maintaining systems at the school level
- Training teachers on the usage of ICT in the classroom
- Developing relevant content
- Leveraging community inclusion to expand impact and sustainability
- Covering the total cost of ownership of ICTs

Most of the challenges developing countries face in harnessing ICT's potentials for education are related to the limited electrical or Internet infrastructure in rural areas,

limited availability of technically skilled support staff, the predominance of minority languages, and underqualified teaching staff (Zhang et al., 2016).

However, the developing countries face many difficulties to accept and use the new educational technologies in the educational system. There is also a big shift to an electronic government in many countries in the Arab world region, for example the UAE, Qatar, Jordan, Egypt, Algeria, Tunisia and Morocco, in which most of the services are done on-line.

Many ICT adoption studies have been widely done in the developed world, yet there is insufficient knowledge regarding ICT adoption in the less developed countries and in the Arab regions. The adoption of technologies in the Arab regions in comparison to other countries in North America, Europe, like other developing countries is still at its very early stages (Khasawneh, 2015; Twati, 2006).Acceptance and usage of ICT in the Arab regions at this stage has not been fully researched by practitioners and researchers in the region. Hence, many countries in these Arab regions still lag behind developed countries in terms of technology acceptance, and many organisations in these regions are not yet ready to embrace ICT(Khasawneh, 2015).Thus, the adoption of new technologies is hampered by a lack of basic infrastructure, senior management support, appropriate funding, eagerness for ICT adoption, level of education and skills, expertise in the field, and the resistance to anything which is new, unclear, and uncertain all impede the adoption of the new technologies (Twati & Gammack, 2006)

The Technology and Innovation Report 2021 urges all developing nations to prepare for a period of deep and rapid technological change that will profoundly affect markets and societies. The report also calls for strengthened international cooperation to build innovation capacities in developing countries, facilitate technology transfer, increase women's participation in digital sectors, conduct technological assessments and promote an inclusive debate on the impact of frontier technologies on sustainable development (UNCTAD, 2021). Developing countries, and whole continents such as Africa, cannot afford to miss this new wave of technological change. Thus, developing countries have to overcome certain factors in order to implement eLearning. Social factors, cultural factors, and organisational factors are some of the considerations that

must be taken into account with regard to the student's acceptance of eLearning in developing countries (Yakubu et al., 2019).

There is substantial evidence that technology can be an effective tool in supporting learning and teaching. However, it is now firmly established that it is critical to understand the ways in which technology is conceptualised to be of use in addressing the challenges of the developing world and the policy environment necessary for this to happen (Hennessy et al., 2010).

As a conclusion to this section, if developing countries can craft policies, mount challenges, and find the budgets, the question remains as to whether they achieve the desired impact on their Education system, economy, and society in regard to the implementation of ICT in Education (Kozma & Vota, 2014). The influence of computers has been studied extensively for many decades in developed countries and a vast body of research amassed on the influence of ICT on teachers and students. However, for a variety of reasons, there is still a paucity of research studies conducted on the educational impact of ICT in developing countries. The work of Salas-Pilco and Law (2018) in Latin America and the Caribbean, Altinay, Yikici, Debes, Deviren and Altinay (2016) in Cyprus, Weber and Hamlaoui (2018) in the Middle East and North Africa (MENA) region, and Sadik (2006) in Egypt are among the few. Unfortunately, the distinguishing feature of literature on educational ICT in developing countries is mainly based on the evaluation of large-scale ICT programs or initiatives and the results appear in the form of reports or conference proceedings, rather than peer-reviewed journal articles.

ICT has a very high profile in developing countries. Many countries have or are formulating ICT policies that involve significant investments in hardware, software, networking, and technical support. There is still relatively little research on ICT in developing countries. Both theory (Kozma, 2011a) and initial research findings demonstrate that ICT policies and programs should include coordinating changes in areas such as teacher training, pedagogical practices (Kozma & Vota, 2014). Thus, additional research is needed on the factors that influence teachers' classroom practices in the realms of developing countries.

2.2. ICT in North Africa and the Middle East (MENA)

A wide range of programmes and projects on ICTs in Education in Africa have activities that involve one or more African countries in varying numbers. These range from high-level intergovernmental, multi-stake-holder programmes such as the NEPAD e-Schools initiative, to institutions focused on networking African schools and universities such as the African Virtual University (AVU), to collaborative learning projects that directly involve learners and teachers from schools in several African countries such as the Global Teenager Project (GTP) and the International Education Resources Network (iEARN). The researchers Farrell and Isaacs (2007) provided an illustrative list of prominent organisations active in supporting and promoting technology-related activities in the Education sector in Africa (see Farrell and Isaacs 2007, for an in-depth discussion).

Launched later in 2015, the ICT Transforming Education in Africa project enhances human and social development in African countries through the use of Information and Communication Technology (ICT) for education. The beneficiaries of the project are teachers and students, primary and secondary public schools, higher education institutions, policy-makers, educational administrators and leaders. It is part of the UNESCO-Korea Funds-in-Trust cooperation. The project aims to:

- Promote and achieve digital pedagogical transformation through ICT-enhanced school models.
- Improve teachers' competences and confidence on the pedagogical use of ICT.
- Facilitate the development of national ICT in education policies and master plans, and knowledge-sharing.
- Align with Education 2030 and national education development priorities to maximise synergies with other key stakeholders in education systems.
- Ensure country ownership by establishing project teams led by education ministries and formed with key implementing agencies (UNESCO, 2021).

In a survey conducted by Farrell and Isaacs (2007) on ICT and education in 53 countries in Africa, Cisco Systems is a global company that promotes networking for the Internet in Africa, Cisco is a leading partner in the New Partnership for Africa's Development (NEPAD) e-Schools programme to which it contributed human and

financial resources. Cisco led a consortium of companies in this project in which it promoted the installation of networking equipment for Internet access and satellite connectivity in schools in Algeria, Ghana, Mauritius, Rwanda, Senegal, and South Africa. It also promoted the use of digital education content and teacher training in these countries. In addition, Cisco has established a Networking Academy programme that trains students to design, build, and maintain computer networks. A number of Networking Academies have been established in Africa in countries like, Ghana, Mauritius, and Nigeria.

Over the years, the MENA region countries have gone through many significant changes. One of these changes is the development and implementation of Information and Communication Technology (ICT) in Education which was introduced as a result of national policies adopted by the Governments with the help of international organisations. However, the implementation and use of ICT in Education seems to lag behind in the MENA region in comparison to many other parts of the world (Chapman & Miric, 2009). At the same time, in many MENA countries, children and youth learn more about how to use various ICT tools informally outside of the school system (UNESCO 2013). MENA countries are trying their best to have a successful ICT implementation by increasing their spending, but it has proven to be worthless without considering other factors that influence ICT success.

The influence of computers has been studied extensively for many decades in developed countries and a vast body of research amassed on the influence of ICT on teachers and students. The work of Salas-Pilco and Law (2018) in Latin America and the Caribbean, Altinay, Yikici, Debes, Deviren, & Altinay (2016) in Cyprus, Weber and Hamlaoui (2018) in the Middle East and North Africa (MENA) region, and Sadik (2006) in Egypt are among the few. For instance, Alayyar, Aljeeran, & Almodaires (2018) conducted a study on the policies toward Information and Communication Technology (ICT) in Education from the perspective of Middle East and North African region (MENA) countries. The most important finding of this study is that countries in the MENA region are willing to move forward the adoption of ICT in education by increasing their spending on planning and implementing ICT in Education. However, the process of planning and implementation is not always successful due to different

factors such as financial challenge, less attention given for the pedagogy behind ICT integration, resistance from actors, lack of cooperation, contextual challenges, technical challenges, and social and political challenges.

ICT is at an embryonic stage in the majority of African countries because there are competences required by both students and teachers to use ICTs in different subjects (Barakabitze et al., 2019). These include (1) competence to make personal use of ICTs in instruction, (2) competence to make use of ICTs in instruction as a tool for teaching, and (3) competence in understanding the policy dimensions of ICTs use in instruction for learning. Similarly, in a review synthesising the literature on uses of Information and Communications Technology (ICT) in education in Africa, Hennessy et al. (2010) point out that Africa suffers from typical infrastructure problems including (1) insufficient numbers of computers and other technologies owing to limited funds; (2) absence of properly developed curricula for teaching ICT skills; (3) lack of subject teachers trained to integrate ICT into learning areas. Qualified teachers are often seen as a catalyst in the introduction and effective use of technology in schools. Unfortunately, however, in many African countries, the lack of trained teachers and the low levels of teachers' ICT knowledge and skills have been identified as major impediments to effectively introducing technology into schools (Harrison, 2010).

In addition, the call for increasing ICT in education from developed countries has encouraged some countries in the MENA region to spend more on planning, buying, and implementing ICT in the education sector. The Kingdom of Saudi Arabia, for example, has invested greatly in developing ICT in the public education sector. The Saudi Government was involved in improving education reform and implementing modern technologies and invested over $2,500,000 (almost £2 billion) in 2007 (Tatweer 2015).

Based on the explanation provided in the previous paragraph, it is clear that countries in the MENA region are being influenced by the developed countries in the field of ICT in education. At the same time, the increased budget and planning in the MENA countries is a clear indication that they are willing to move forward in their adoption of ICT (Alayyar et al., 2018). However, there are other issues surrounding the adoption process – whether it is before, during, or after adoption – that decision makers should

consider. Thus, it is of paramount importance for the Government leaders in the MENA region to understand that installing ICT will not automatically improve learning standards. As Abuloum and Qablan (2008) put it, the 'goals of using ICT' and 'the actual accompanying pedagogy' must not be overlooked. Policy-makers in the MENA region do not offer a pedagogical model or pedagogical vision toward the ICT implementation process (Alayyar et al., 2018). This lack of focus and interest has contributed to the absence of strategic directions on how to implement ICT policy and use ICT in the classrooms as expressed by Alkhezzi and Abdelmagid (2011) in their empirical qualitative research on the use of computers by Kuwaiti teachers.

2.3. Promoting ICT Use in the Arab World

Undeniably, the 21st century has witnessed a growing interest in most countries of the Arab world with regard to the implementation of Information and Communication Technology (ICT) at the level of Higher Education Institutions (HEIs). ICT is still considered in its beginning stage in the developing countries such as the Arab world especially in the field of teaching and learning process. In this regard, Algeria as one of the Arab countries is trying to use ICT in all sectors, particularly in Education and Higher Education sectors. In a similar vein, Jordan as one of the developing countries tries to become a leader in the Arab world by using ICT in all sectors, particularly in Education and Higher Education, where Jordan is widely regarded as having one of the best systems in the Arab region (Khasawneh, 2015). A more recent report by UNCTAD (2021) states that Jordan also is doing well, again reflecting supportive Government policy. Jordan is one of the first Arab countries to support ICT as a standalone economic sector, and it had the first nationwide ICT strategy in 1999. Jordan now has a young, digitally literate population and high Internet penetration. Nevertheless, many countries in the Arab States continue to lag behind richer countries to fully implement ICT in their education systems (UNESCO, 2013).

According to Hafkin and Taggart (2001),promoting ICT in Education is seen as so crucial to the progress of developing countries that the United Nations placed it third on the list of the most important global issues after poverty and domestic violence. In this respect, many projects and activities have been carried out to promote the use of ICT in

Education in the Arab world. Hence, several initiatives have been launched in the Arab countries of the Middle-East and North African (MENA) region that acknowledge e-learning and integration of IT in education as a tool for educational development and enhancement. For instance, the United Nations Development Program (UNDP) in 2003 created a program called Information Communication Technologies in the Arab Region (henceforth, ICTDAR) to help Arab countries in 'harnessing ICT to reduce poverty and improve both public administration performance and private sector hold and expansion'. ICTDAR has been described as 'human development' driven by the active use of ICT to build, develop, and sustain knowledge acquisition and utilisation'. In a 2004 report by the Regional Program for Arab States of the UNDP, the Arab region was described as having the lowest levels of ICT usage relative to other world regions (Abu-Samak, 2006).

The United Nations Development Program sees ICT as a means to help the Arab region to embrace modernisation at every level, by moving from rigid, central structures to flexible decentralised ones. The United Nations Conference on Trade and Development (UNCTAD) compiled a 2004 report detailing ICT indices in the developing countries and comparing them with those in Europe and the U.S. The purpose of the UNCTAD is to monitor the developed countries in relation to their technological efforts to 'leapfrog' and fill the growing 'digital divide' between Western and Eastern developed countries. The UNCTAD report advised Arab countries to see the development of ICT as tied 'to the development of Education, trade, health, and other sectors to generate wider benefits,' and argued that technology is important in the 'knowledge economy of the global market'.

Also, the Arab League Educational, Cultural and Scientific Organization (ALECSO)[1] has, as its primary responsibility, the promotion and coordination of educational, cultural and scientific activities for some Arab countries. In this perspective, an ongoing plan entitled 'Plan for the Development of Education in the Arab Countries' is being implemented by ALECSO over 10 years (2008–2018). The

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[1] The Arab League Educational, Cultural and Scientific Organization (ALECSO), founded in 1975 and headquartered in Tunis. ALECSO works under the umbrella of the Arab League and has a membership of 22 Arab countries. ALECSO strives to create and coordinate projects and activities in the fields of education, culture, and science in the Arab region (Jemni & Khribi, 2017).

implementation plan aims at systematically developing the Arab Educational system, mainly through the effective use of ICTs in Education (Jemni & Khribi, 2017). In this context, ALECSO ICT department has proposed a comprehensive project aiming to promote and empower Open Educational Resources (OERs) and Massive Open Online Courses (MOOCs) use and development in some Arab countries. Hence, the Information and Communication direction in the ALECSO organisation endeavours to well define a set of innovative and emerging issues (such as OERs, MOOCs, Educational Mobile Applications, and Educational Accessibility), according to which, several projects are being conducted, aiming to contribute in the modernisation and the development of the educational Arab system (Jemni, 2014).In this regard, ALECSO expressed a great interest and willingness to provide valuable contributions for the achievement of regional initiatives, implementation plans, and projects to promote and develop education and technologies in the Arab world (Jemni & Khribi, 2017). In March 2014 , the Director General of ALECSO at the fourteenth international ministerial conference of Arab Ministers of Higher Education and Research in Riyadh (Saudi Arabia) highlights the great importance of examining the development of the Open and Distance Education (ODE) in the Arab world that could serve all areas of the States and all categories of the population in particular those who are in the field of Higher Education(Gedeon & Khalil, 2015).Nevertheless, reviewing the existing research also showed that ICT development in Arab countries continued to lag behind in comparison to its development in other countries, thus creating obstacles for individuals to view technology as a positive step towards evolution and change.

Mohamed Jemni and Koutheair Khribi(Jemni & Khribi, 2017) describe the efforts and the ongoing projects of the Arab League Educational, Cultural and Scientific Organization (ALECSO) towards promoting the effective use of ICT in Education, especially through fostering the development and adoption of open learning, mobile technologies, and cloud computing, creating the so-called 'ALECSO Smart Learning Framework.' They describe first the status of ICT use in Education in the Arab region through conducted studies and surveys, and then review the completed and ongoing activities with respect to the aforementioned ALECSO Framework's dimensions. To this end, ALECSO organization (Jemni & Khribi, 2017) intends to promote the use and

production of Open Educational Resources and Massive Open Online Courses in the Arab region, which will guarantee consequently :

– Better access to education;

– More opportunities in individual anytime and anywhere learning;

– Extra learner-centric focus; – Lifelong learning promotion;

– Flexible, adaptive, and engaged learning;

– High-quality online educational content development (Jemni & Khribi, 2017).

However, according to Khan and Qudrat-ullah (2021), there are some challenges associated with distance learning (d-learning) and electronic learning (e-learning) in Arab countries. Traditional classroom teaching and learning have been the norm for years and to ask students not to come to class may feel strange and perhaps difficult to accept . Thankfully, some of the Arab states have realised these challenges and have aroused the importance of reviewing the state of Education, and formulating appropriate strategies and plans to improve Education, benefiting from new technologies and their myriad advantages (Jemni & Khribi, 2017).

Another reason for non-effective activation of online learning might be the fact that compared to developed countries, the Internet is not easily accessible by all students as the infrastructure for the Internet is still not well connected in all regions of Algeria, especially for people living in the hinterland. One of the most important barriers to the willingness of various Arab Universities to adopt online learning is that web-based degrees are not always accepted, and candidates will consequently have fewer job opportunities compared to traditional F2F degrees (Al-Hunaiyyan et al., 2016).

Arab Universities have been confronted with numerous challenges in their external and internal environments since the year 2000 (Al-Hunaiyyan et al., 2016). They are forced to respond to emerging challenges such as the continual developments in Information and Communication Technology (ICT); changing demographics and expectation of learners; and decreasing financial support. There are many factors and reasons imposing the necessity of shifting to applying Open Education that is to say, embracing the development of virtual Universities such as geographical boundaries, age, financial and time management (Kurilovas et al., 2014). There is no doubt that Arab countries are overtly influenced by these motives. However, the use of Open Education

has become a necessity insisted by both: the local conditions of some Arab countries (Amin et al., 2012) and the global factors evenly. In addition to that, there are: Social, cultural, geographical reasons; Humanitarian and psychological reasons; Economic and political motives too (Al-Hunaiyyan et al., 2016).

Some limitations regarding the implementation of distance learning in Arab countries were reported by (Mirza & Al-Abdulkareem, 2011) such as lack of a strong telecommunication infrastructure, shortage of technical staff, the poor readiness of students and faculty members, government policies, and financial matters. The availability of financial resources stands as a major challenge in most Arab countries. However, ensuring the sustainability of its flow is the biggest challenge ever. Another main factor in some Arab countries is a lack of Government interest and policies (Al-Hunaiyyan et al., 2016). A better distance learning system is an efficient solution to address these limitations and provide better platforms for learners. These are effective solutions for Higher Education (HE) in Arab Universities due to limited resources and opportunities to facilitate students' enrolments.

According to Mirza & Al-Abdulkareem (2011), a good number of reasons can be blamed for the passive attitude that many Arab Governments took in response to e-learning. The biggest and probably most important reason was the very low Internet penetration rate by the general public(Nour, 2002, 2006). This factor in itself can be attributed to many reasons including the initial high costs associated with Internet access, low speed and quality Internet connections(Mirza, 1998 as cited in Mirza & Al-Abdulkareem, 2011).Another important reason for the hesitation of many University academics to resort to e-learning is the low public esteem for online learning (Al-Hunaiyyan et al., 2016). Additionally, teachers and learners' attitude and lack of prior knowledge of IT use are major factors that affect the acceptance and use of technology in Education in the Arab world (Abbad, Morris & De Nahlik, 2009; Makhlouf & Bensafi, 2021).

Despite the opportunities and significant development and the inclusion of ICT offered to foster and improve the teaching and learning process around the world (Tarhini et al. 2016; Zabadi & Al-Alawi, 2016), most developing countries still rely heavily on traditional teaching method and learning pedagogy due resources constrained

(Tarhini, Elyas, Akour, & Al-Salti, 2016). However, the ICT has become a major factor in the world that drives social, economic and human development. The rapidly growing use of ICT and the Internet by the government, non-government, and individuals in the Arab world has changed many things from the traditional to the digital world. Thus, educational amendments associated with the advancement of the 21st century learning skills have become a trigger for the huge investment in the ICT foundation in the Higher Education Institutions in the Arab world.

Some recent studies have highlighted both the opportunities and the challenges that ICT has imposed on the world economy, especially in the Arab region. For instance, the researcher (Nour, 2002, 2006) examined the status and the determinants of ICT diffusion in the Arab countries and the potential opportunities and challenges that ICT is expected to create for development in the Arab region. The study adopted the descriptive approach, using secondary data and information. The analysis showed that, despite the recent growth in the demand for ICT, it had a very limited market in the Arab region, as indicated by the lukewarm demand, limited supply and low investments in comparison to the world total. The diffusion of ICT was characterised by a market concentration in the richer Gulf countries and the wide difference between these and other Arab countries in terms of demand, supply, price and the intensity of the services. The analysis also showed that the diffusion of ICT in the Arab world significantly increased in relation to economic growth. As highlighted by the study, ICT has the potential to impose the so-called creative destruction process in the Arab world (Nour, 2002).

On the whole, the low diffusion rate of ICT in the Arab world is exacerbated by many problems (Nour, 2002). These include: (i) inadequate investment and lack of infrastructure; (ii) inadequate awareness of the importance of ICT in the new economy, particularly of the value/importance of the Internet and intranet in daily operations; (iii) insufficient R&D in ICT-related issues; (iv) deficient services resulting either from low speed rate or disconnection; (v) the lack of a network system minimises the efficiency benefit of the services; (vi) low demand by consumers, as a result of either the limited capacity/availability and efficiency of the services, or the high costs; (vii) uncertainty/risk aversion on the supply side because deficient and limited demand discourage investments and expansion of the services; (viii) poverty in some countries

in the region restricts demand; (ix) higher costs of the services discourage both demand and supply and (x) language problems caused by the preference for Arabic, or unfamiliarity with other languages, which reduces the maximum benefit to be gained from the Internet, especially with regard to websites offered in other languages.

Similar to other countries, the Arab nations have the opportunity to benefit from the wide and fast diffusion of ICT. In particular, ICT has the potential to accelerate economic development in the region by:

- Improving the knowledge-based economy by (a) increasing the efficiency of the educational system and learning to benefit from long-distance teaching in the near future; (b) developing the communication system through the provision of cheaper, easier, faster and more efficient services; (c) Upgrading skills and developing human resources through improved educational and training systems and enhancing the capability of people.

- Accelerating the catching-up effect. The diffusion of ICT can be used to accelerate and facilitate efforts to bridge the gap with the advanced countries.

- Advancing R&D efforts by motivating and facilitating the collaboration between research Institutes and Organisations in the region, thus promoting research activities in the region (Nour, 2006).

In parallel, European Universities entered the Bologna Process[2] (1999) to develop common standards and procedures, including accreditation, to encourage student and faculty mobility among European universities. The Bologna Process led to the establishment of the European Higher Education Area. Then, the European Union sought links with Universities in the MENA through exchanges, joint Degree Programs, and Research. Tentative but so far ineffective steps have been taken to create an Arab Education Area (Waterbury, 2019).

In summary , the review of available literature on the status of ICT and its use in Education in Arab countries (Magin 2010; Agency 2014; Bannayan et al. 2012; Darwish 2013; HBMSU 2015) uncovered disparate level of readiness and preparedness among

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[2] The Bologna Process is an educational agreement between 47 countries, which was launched in 1999 and signed by 29 European countries. It aimed at the creation of standardised cooperative and international educational schemes to facilitate student's mobility, student centred approach and collaboration between universities (European Commission, EACEA, Eurydice, 2015) (Medfouni, 2020)

various countries (Jemni & Khribi, 2017).Like other modern technologies, ICT has the ability to impose the creative destruction effect by providing opportunities for development, but simultaneously also creating hazards to development in the Arab region (Nour, 2002). Fortunately, our study seeks an empirical investigation of the determinants that influence teachers' acceptance and use of ICT by using the Universal Theory of Acceptance and Use Technology (UTAUT) framework.

2.4. Review of Studies Conducted in the Arab World

There is a growing body of research that attempts to explain teachers and students' actual use of technology by identifying the factors that support or hinder technology integration in the Arab world (Khan & Qudrat-ullah, 2021; Morchid, 2019; Zalah, 2018). For instance, in the Middle East, Tarhini, et al. (2014) empirically investigated the factors that influenced the acceptance and use of e-learning in Lebanon, and the role of a set of individual differences as moderators (e.g. age, gender, experience, educational level) in an extended Technology Acceptance Model (TAM). A quantitative methodology approach was adopted in this study. To test the hypothesised research model, data was collected from 569 undergraduate and postgraduate students studying in Lebanon via survey questionnaire. The collected data were analysed using Structural Equation Modelling (SEM) technique based on AMOS methods in conjunction with multi-group analysis. The findings showed that Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Subjective Norms (SN) and Quality of Work Life (QWL) positively affected students' behavioural intention (BI). The researchers of this study also found that experience moderated the relationship between PEOU, PU and SN on e-learning use intention, and that age difference moderated the effects of PEOU, SN and QWL on BI. In addition, educational level moderated the effects of PEOU, SN on BI, and gender moderated the effects of PU, SN and QWL on BI. Contrary to expectations, a moderating role of age on the relationship between PU and BI was not found. Similarly, gender was not found to affect the relationship between PEOU and BI, and educational level did not moderate the relationship between PU or QWL and BI.

There is an increasing number of empirical studies attempting to explain the factors that promote and/or hinder teachers' acceptance and use of Information Technology in

their classroom practices in the Arab world context of Higher Education Institutions. As an example, in a comparative study, Dhaou and Abdessemed (2010) surveyed e-learning services and analysed the key factors for the successful implementation of the ICTs in Higher Education through three case studies in the Arab world, namely: Tunisia, Saudi Arabia and Algeria. The data pointed that tremendous efforts have been undertaken in by the three Governments of these countries to further enhance quality of Education through the effective use of ICTs, e-learning and e-training. Though the three Arab countries have experienced huge transitions towards openness and quality in Higher Education, ICT and e-learning remain at inadequate levels of exploration and deployment.

Abodher (2014) explored the extent of Information and Communication Technology (ICT) use at the University of Tripoli, Libya. Qualitative data were collected through semi-structured interviews with forty-four graduate students and eleven academics from six Faculties from the University of Tripoli, Libya. The protocol of the interview questions was based on an extended version of the Technology Acceptance Model (TAM). Findings from study showed that all the informants had used some form of ICT, and they had some basic knowledge of ICT tools such as computer laboratories and Internet connection. All of them agreed that the use of tools had transformed their ways of teaching and learning. The findings also demonstrated that the majority of the informants believed that lack of training and a lack of adequate infrastructure were the main barriers that fenced to the use of ICT.

Bellaaj, Zekri, and Albugami (2015) explored the determinants of the continued use of e-learning system among 103 students at the University of Tabuk in Saudi Arabia by applying the UTAUT model. The questionnaire was the main data collection tool. The findings revealed that performance expectancy, and effort expectancy determined the intention of continued use of e-learning system. With stronger Internet experience, the effect of performance expectancy increased, and the influence of effort expectancy decreased. In addition, the effect of social influence on intention of continued use was stronger for women than for men. Furthermore, the findings of this research showed that the users of e-learning systems of the University of Tabuk were primarily a goal-oriented

individuals. Students were seeking mainly the advantages offered by the use of technology.

Another study which analyses the factors that can explain the adoption and effective use of a new e-learning system was conducted by Ameen, Willis, Abdullah and Shah (2019) in Iraq. The study used a selection of factors that were present in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) model, and it incorporated three additional factors: *technical support, system quality* and *information quality*. Questionnaires were distributed to 300 university students in Iraq. Partial Least Squares-Structural Equation Modelling (PLS-SEM) was used to analyse the data received. The findings suggested that perceived usefulness (PU), perceived ease of use (PEOU), subjective norms (SNs), information quality (IQ), system quality (SQ), technical support (TS) and self-efficacy (SE) had significant effects on behavioural intention (BI). In turn, BI and TS had significant direct effects on the actual use (AU) of e-learning systems. The factors age, gender and experience significantly moderated some of the relationships in the model.

Altalhi (2020) used a UTAUT model to identify the major factors determining learners' acceptance of Massive Open Online Courses (MOOCs) in Saudi Arabia Higher Education. An online survey was administered to 169 students of Taif University and Structural Equation Modelling (SEM) was used to analyse the data. Unexpectedly, the author found that behavioural intention was affected only by attitude. The actual use was affected by behavioural intention, attitude, and facilitating conditions. Attitude was affected by performance expectancy, social influence, and computer self-efficacy. In addition, computer self-efficacy as an external factor had an important effect on performance expectancy, effort expectancy, and attitude. In the same vein and in a more recent study in Saudi Arabia, Khan and Qudrat-ullah (2021) developed and employed the revised 'Unified Theory of Acceptance and Use of Technology' (UTAUT2) model to assess the factors that influenced the acceptance and use of LMS technology among instructors in the cultural context of Higher Education Institutions of Saudi Arabia. The results showed that the constructs Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Hedonic Motivation (except Habit) were significant and were strong predictors in the adoption of LMS.

Another study was carried out more recently by Gharrah and Aljaafreh (2021) in Jordan. The research aimed at identifying the factors affecting students' Actual Usage of Social Networks Sites for educational purposes in Jordanian universities. The data were gathered from 380 students. The statistical package for social sciences (SPSS 23.0) was used to determine the factors affecting the students' actual use of s for educational purposes. Similarly, Khasawneh (2015) examined the potential prominent factors related to the usage of ICT in the Jordanian public universities among the academic staff by applying the Decomposed Theory of Planned Behaviour (DTPB). The findings showed that self-efficacy (SE), and facilitating condition (FC) had positively affected the Behavioural Intention (BI) to use ICT in the Higher Educational System among academic staff. There was also a significant relationship between academic staff's perception of technology characteristics and their Perceived Behavioural Control (PBC) towards using the technology in the educational system.

In a cross-sectional study, El-Masri & Tarhini (2021) examined the major factors that may enable or hinder e-learning systems by University students in developing (Qatar) as well as developed (USA) countries. The study adopted the extended Model of Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) with Trust as an external variable. Data were collected from 833 University students from a University in Qatar and another one from the USA by using an online survey. The Universities in both of the two countries were predominantly running courses in Business, Economics, Information Systems and Social Science at the masters or undergraduate level. Structural equation modelling was employed as the main method of analysis in this study. The results showed that Performance Expectancy, Hedonic Motivation, Habit and Trust were significant predictors of Behavioural Intention (BI) in both samples. The results also showed that Effort Expectancy and Social Influence led to an increase in students' adoption of e-learning systems in developing countries but not in developed countries. Moreover, facilitating conditions increased e-learning adoption in developed countries which was not the case in developing countries.

Furthermore, Mhamed Alshref, Abas and Abu Bakar (2021) conducted a systematic literature review (SLR) focusing on the eLearning technology acceptance theories and models and open issues and challenges facing Libyan Higher Education Institutions

(LHEIs). The study aimed to investigate the factors influencing the adoption and use of eLearning technology by academic staff in Libyan HEIs. The findings revealed that the Technology Acceptance Model (TAM) is the most dominant theoretical model applied to test the adoption of eLearning in LHEIs. The finding further revealed that there are limited studies based on other technology acceptance theories such as the Unified Theory of Acceptance and Use of Technology (UTAUT), the Theory of Reasoned Action (TRA), and the Theory of Planned Behaviour (TPB). Hence, this study recommends the adoption of the UTAUT framework for future research due to its foundation from eight different technology acceptance models, including the dominant TAM theory, which could offer new insights especially in the Arab region.

On the basis of the preceding empirical and theoretical studies referred to and conducted in the Arab region. There is research gap in regard to the determinants of teachers' acceptance and use of ICT at the level of Higher Education Institutions in Algeria. Hence, this present study tries to shed light on the current use of ICT by EFL teachers in another country in the Arab world. It hopes to help in presenting a more comprehensive description of the region in terms of ICT implementation for future initiatives and evaluations. Therefore, it seems important to investigate factors influencing teachers' acceptance and use of Information and Communication Technology (ICT) based on the UTAUT framework in the context of Arab countries, specifically Algeria as one of the countries still struggling with conventional face-to-face teaching and learning methods in Higher Education Institutions.

2.5. Algeria: The Context of the Research Study

As our study was conducted in the Republic of Algeria, here we provide some background information about this country.

Algeria, known officially as the People's Democratic Republic of Algeria, is an Arab, Muslim, and African country. It is located in the Maghreb region in the North West of Africa with the Mediterranean Sea to the north with a coastline stretching close to 998 kilometers between Morocco and Tunisia. It shares land borders with Tunisia and Libya in the East, Niger in the southeast, Mali and Mauritania in the southwest, and Morocco and Western Sahara in the west. Algeria has an area of 2,381,741 square

kilometres (919,595 sq mi); it is therefore the tenth biggest country in the world and the largest one in Africa and the Arab world as shown below in Fig.2.1. Its population is 44 million in 2021 (Internet World Statistics, 2021), and its official languages are Arabic and Berber. Algeria became an independent nation from French occupation in July1962. The country consists of 48 wilaya (provinces). The capital and largest city is Algiers, located in the far north, on the Mediterranean coast.
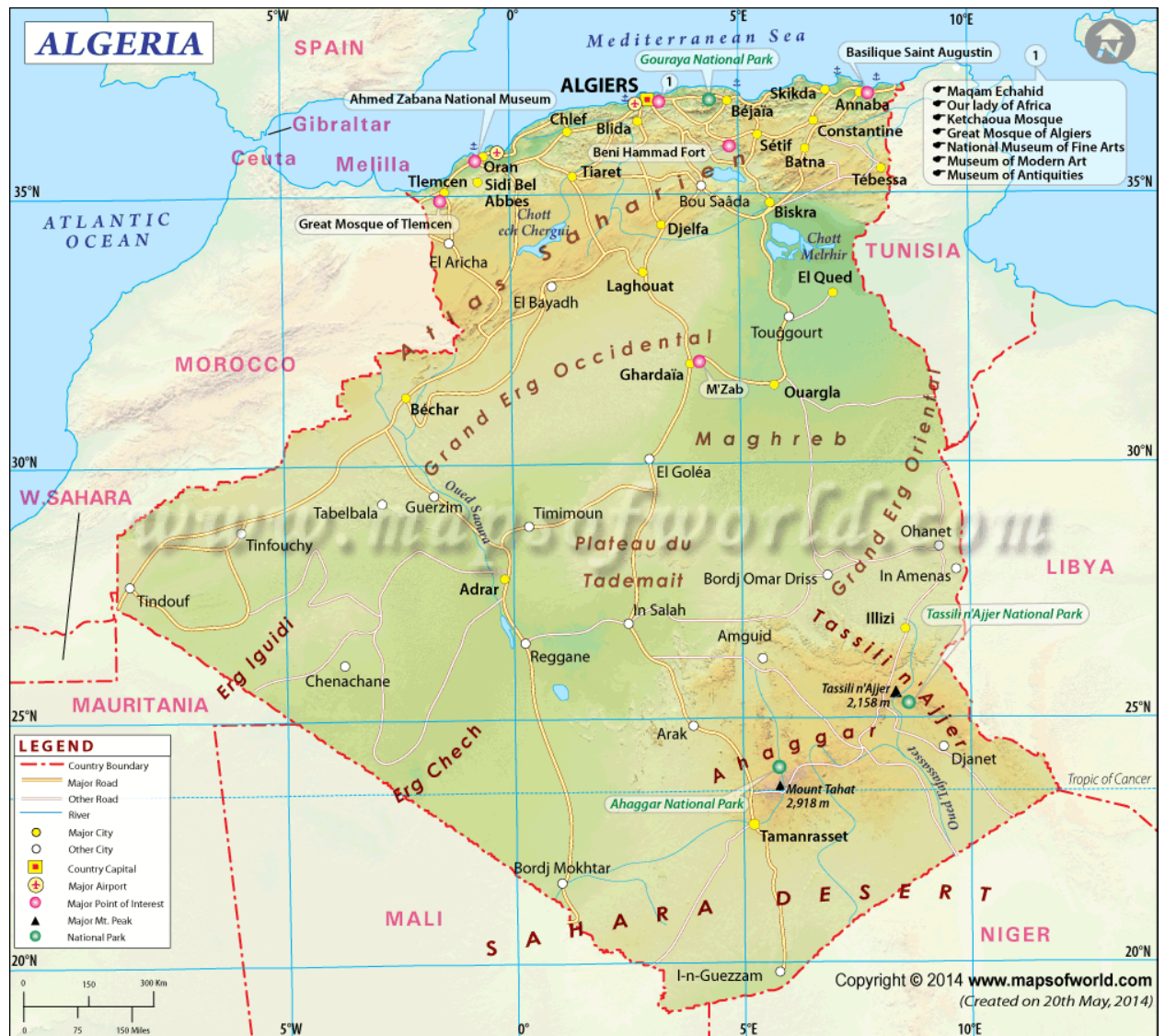
Figure 2.1 Map of Algeria. Source (The World Fact Book, 2020)

More than half a century after becoming an independent nation from French occupation in July1962, the People's Democratic Republic of Algeria, as the largest

country on the African continent by area, is a member of the influential Arab League, and a key player in the Maghreb(Chachoua & Schoelen, 2020, p. 783). It is a modern Arab nation.

The Algerian Education system has been undergoing several reforms since its independence from France in 1960, including those in 1973, 1999, and 2006. The 1973 reform led to the almost complete universalization of Arabic as the language of instruction in the Algerian education system. Before the reform, the programs and the diploma system were modeled after the French system, and the Arabic language was less used. The 1999 reform gave greater weight to bilingualism and engaged in the modernization and openness of education system development. The main thrust of the 2006 reform was quality improvement, which led to a better preparation of High School students for further study, including the acquisition of cross-curricular skills, such as computer science and foreign languages, and was specifically targeted to higher education and research (IIEP-Pole de Dakar 2018).

Algeria is a developing country where technology acceptance at an individual and business level is highly influenced by the Government policies. When the Internet was launched in 1994 under the auspices of the Scientific and Technical Information Research Centre (CERIST)[3], a prime concern for the Algerian Government was about the development of ICT-related human resources(M. D. Djoudi, 2010). Therefore, a Committee in charge of defining the elements of an Algerian National Information Society Strategy was formed. It was anticipated that the Committee will work on creating synergies among the different sectors in the area of infrastructure, training, and research as well as information systems and ICTs (Hamdy, 2007).

The system that is currently made available to the teachers and learners included Moodle as LMS. The Moodle Learning Management System (LMS) can fully support a

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[3] CERIST is a Research Center affiliated with the Ministry of Higher Education and Scientific Research. It was created in 1985, with the main mission of designing and implementing the National Information System(Bakelli & Benrahmoun, 2003). It is headquartered in Algiers (the capital) and has representations in all Algerian geographic areas (the north, east, west and south) through three main Regional Sites and more than seven focal Points, which are generally hosted by local universities(Bakelli, 2002).

distance learning environment or act as a supplemental pedagogical site for face-to-face (F2F) learning or can provide a hybrid course through a blended learning environment. The advantages of online programs are that they can be used by teachers, learners and professionals. The use of distance learning has produced new opportunities for Higher Education in Algeria.

Hassiba Benbouali University of Chlef, where the current study takes place, is a public University in Algeria in the province of Chlef, founded in 2001, grouping several national Higher Education Institutions. The University is named after Hassiba Benbouali who died as a martyr of the Algerian Independence War, aged 19 in 1957 (The World University Rankings, n.d.). The University is well equipped with educational technologies and both teachers and students were strongly encouraged to learn and use the latest technology. The University's internal policy explicitly emphasizes on the use of ICT by students from home – mainly through the Learning Management System (LMS) Moodle – and teachers are encouraged to make use of all available technology, especially with the spread of COVID-19[4]. However, a few English teachers did not favour this learning model. They claimed that ICT, and especially computers in class, impede rather than promote learning. This claim needed to be investigated and hence an exploratory mixed methods study based on teachers' experiences and perceptions was planned so as to better understand the determinants for teachers to accept and use ICT in their teaching practices.

The University of Chlef has also invested in ICT application in teaching Foreign Languages. In accordance with a Ministerial Decree No. 365 issued by the Ministry of Higher Education and Scientific Research in Algeria in May 2020, TICELET laboratory (Information and Communication Technologies in the Teaching of Foreign Languages and Translation) was established in the Faculty of Foreign Languages at Hassiba Ben Bouali University of Chlef. It brings together a diverse group of 25 teacher-researchers from various languages. It promises to conduct multilingual (English, French, Arabic)

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[4] The COVID-19 emerged in the year 2019, in the Wuhan, China, and was soon declared a pandemic as it spread worldwide due to its extremely high infectious rate (Raza & Qazi, 2020).

and transdisciplinary research in subjects ranging from general language teaching to technical language teaching.

TICELET laboratory (Information and Communication Technologies in Foreign Language Teaching and Translation) of the Faculty of Letters and Languages of Hassiba Ben Bouali University of Chlef (**https://www.univ-chlef.dz/labo/LTICELET/**) brings together researchers around various projects aiming at improving foreign language teaching and learning. It is multilingual and multidisciplinary research lab covering ESP, FOS, Fou, FOG, applied linguistics, literature and ICT(TICELET, 2021).

Hence, TICELET laboratory covers the following research objectives:

- Creation of innovative actions.
- Making a concrete use of ICT in teaching practices
- Transformation of teachings towards a combined / hybridized form,
- Creation of shared digital resources
- Creation of platforms for hybrid teaching and learning.
- Working on ESP and translation in order to develop courses and glossaries(TICELET, 2021).

At the time of writing of this thesis in the third week of January 2021, there was also the creation of a print journal attached to the laboratory of TICELET titled "*Journal of Languages and Translation*") , Faculty of Foreign Languages, at Hassiba Ben Bouali University of Chlef with its underway second volume. The foundation of this journal is the result of a fruitful and successful collaboration between the teachers from different faculties of languages at Hassiba Benbouali University of Chlef. The aims and scope of the journal (**https://www.asjp.cerist.dz/en/PresentationRevue/710**) call for "original, theoretical and practical submissions in the fields of Languages and Translation Studies in English, French and Arabic catering to the needs of the digital age".

Furthermore, there was the creation of Technology and Innovation Center. This project aims to improve capacities and national competences in the field of exploitation online databases and databases on patents and several of scientific and technical journals available through the various networks of the world Organization of Intellectual Property (WIPO).Thus, the Centre of Technology and Innovation Support is intended to facilitate the use of the bases for implementation of the CATI in Algeria project which

includes technical, legal and business information to support operations linked to technology transfer and training (Technology and Innovation Center, 2019).

2.5.1. Organisation of the Higher Education System in Algeria

Since its independence in 1962, Algeria has considered Education as one of the main priorities. The Algerian Government has sought to satisfy the needs of the newly independent nation and improve its human assets. A modern Primary and Secondary Education was set up. It was organised and made official by the promulgation of the law of education and schooling became compulsory and free of charge (Mediterranean Recognition Information Centres (Meric-Net), 2019).

The Algerian educational system is divided into several levels: preparatory, basic (primary and secondary), secondary, vocational and higher education. In Algeria, all education policies are subject to government control. The Ministry of National Education (MoNE) and the Ministry of Higher Education and Scientific Research (MoHESR) are the two main agencies in charge of education administration (MoHESR, hereafter). Other government entities with educational responsibility exist, but these two are the primary service providers. In keeping with the scope of this research, this section of the chapter focuses solely on the structure of Algeria's Higher Education system.

Access to Higher Education is subject to obtaining baccalaureate or an equivalent foreign qualification. In 1962, Algeria had only three Higher Education establishments (Algiers, Oran and Constantine) with fewer than 2,000 students, of which only 1% were women, and a total of 250 teaching staff (Mediterranean Recognition Information Centres (MERIC-Net), 2019). It was only after independence (1963) that the Algerian Government began to rebuild its country and its educational system. After the creation of the Ministry of Higher Education and Scientific Research in the 1970s, Universities gradually came into being. Hence, access to Higher Education is guaranteed to any student who has completed secondary education successfully and holding a baccalaureate degree "Baccalauréat" or an equivalent foreign diploma.

The Algerian University network comprises one hundred and six (109) Higher Education Institutions in 2020 spread over forty-eight wilayas (48), covering the entire national territory. The network consists of fifty-four (54) universities, nine (9) university

centres, twenty (20) national and ten (11) higher schools, eleven (11) higher teacher training colleges and two (2) annexes. (Ministry of Higher Education and Scientific Research (MESRS), 2020, 2021). These academic institutions are organised in schools and institutes to support educational activities, scientific and research with an academic staff estimated at 30,510 (Dhaou & Abdessemed, 2010).Figure 2.2 demonstrates diagrammatically the current University network in Algeria.
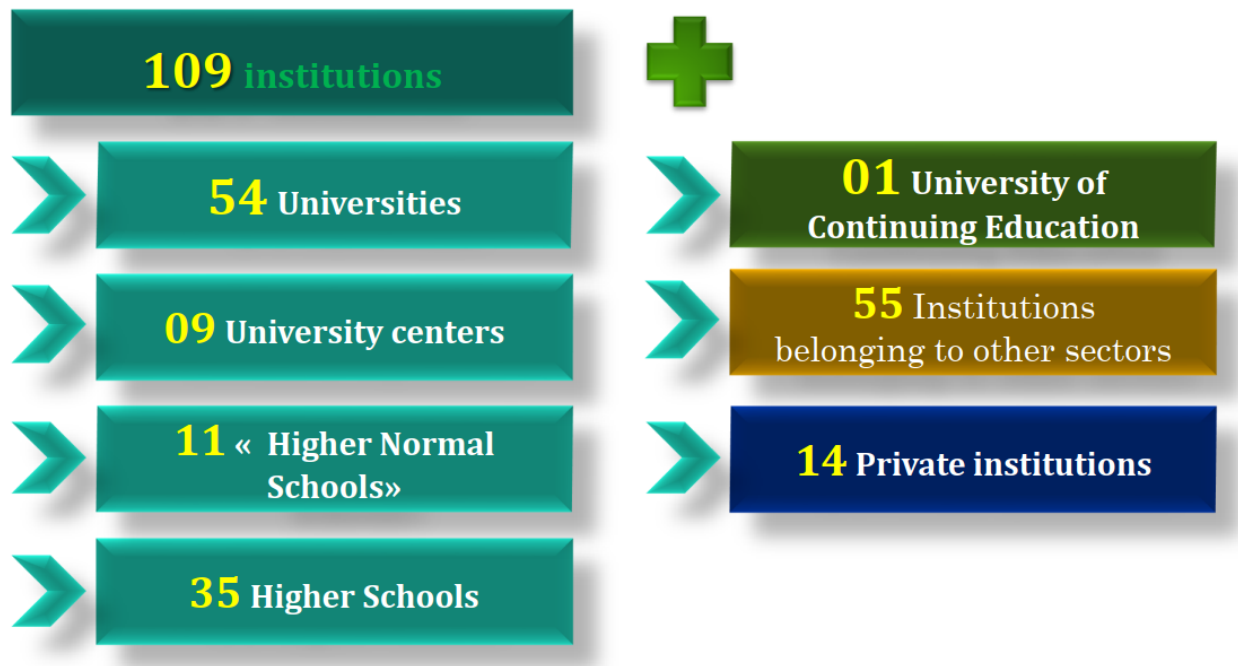
Figure 2.2 The Current University Network (Ministry of Higher Education and Scientific Research (MESRS), 2020, p. 5)

The Ministry of Higher Education and Scientific Research was established in 1971 to supervise all aspects of Higher Education learning in Algeria. The Ministry is responsible for determining the policies and direction of the Higher Education System in Algeria. Hence, Higher Education is provided by universities, specialised institutes, national institutes of Higher Education, and teacher training institutes, which fall under the responsibility of the Ministry of Higher Education and Scientific Research, as well as by institutes run by other ministries. The specific degrees awarded are determined by the field of study, not the institution. The Ministry of Higher Education approves the curriculum, which is standardised for each field of study (Djoudi,2010; Hamdy, 2007). The Structure of Education System in Algeria is shown in Figure 2.3
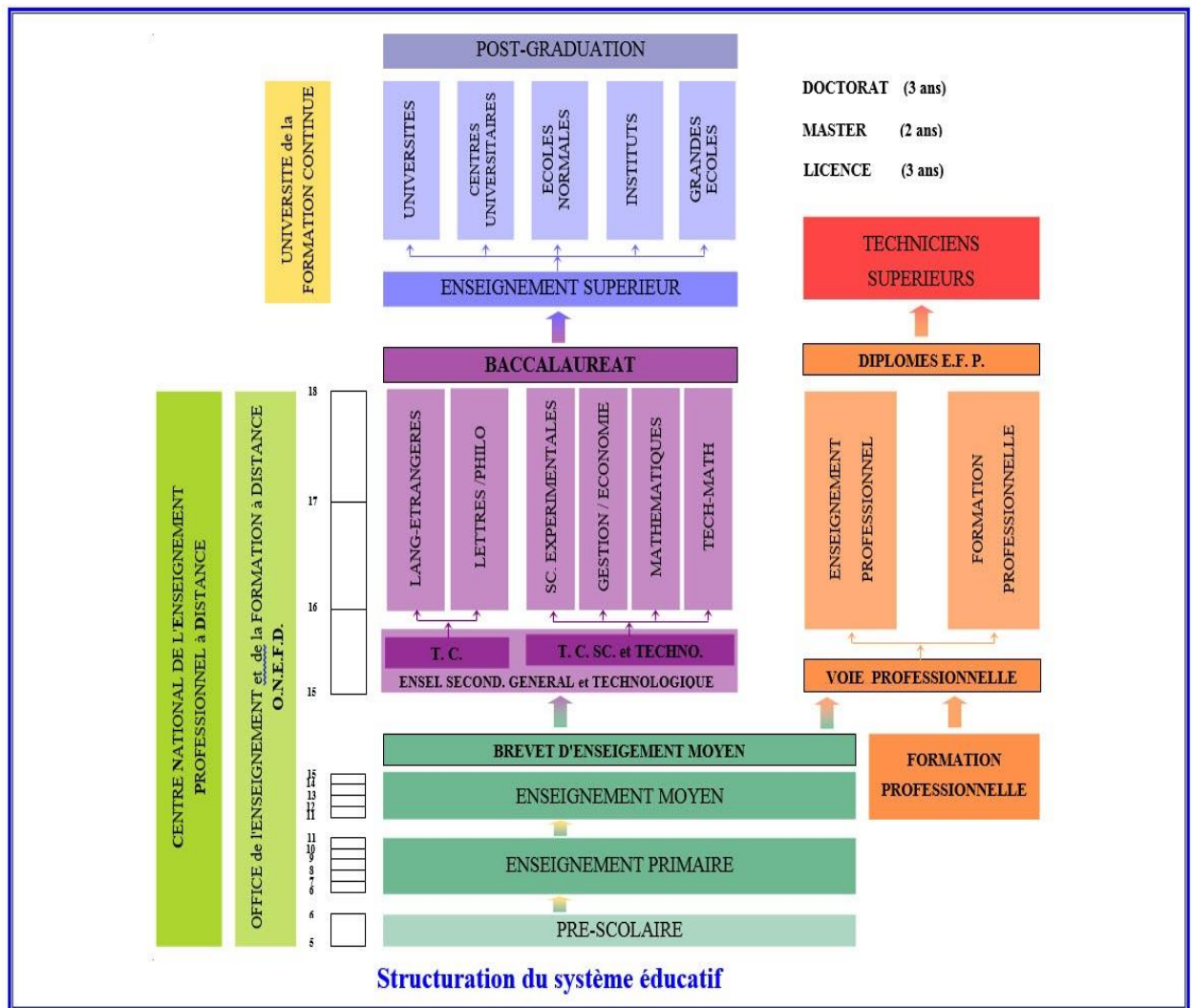
Figure 2.3 Structure of the Education System of Algeria (Ministry of National Education, 2021)

For historical reasons dating back to the French colonization, the organization of the Algerian educational system was affected by the Napoleonic system. Algeria, like all other nations, has faced the issue of globalisation in Higher Education, which has favoured the establishment of the BMD system (Mediterranean Recognition Information Centres (MERIC-Net), 2019). This reform has resulted in a significant revision of curricula as well as new educational approaches. The key reason for choosing BMD was to maximize opportunities and open up to the international stage. Algeria switched from the previous system (4-year Licence, 2-year Magister, 3-4-year Doctorat) to the BMD in 2004. (3- year Bachelor, 2-year Master and 3-year Doctorate).

2.5.2. ICT Adoption in Algeria

Information and Communication Technology (ICT) seems to be rapidly growing in Algeria. The Algerian Government has taken various steps to transform Algeria into a digital society (Lahmar & Benzidane, 2019). Since 2000, the Algerian technological landscape has witnessed significant transformations that led to a noticeable growth in accessing the Internet (Benamra, 2021). The number of Internet users grew from around half a million in 2000 to 25 million by the end of 2020 (Internet World Statistics, 2021). This rapid development in technology is credited to the reduced prices of computers and the Internet. Algeria has made a huge investment to improve the educational system.

2.5.2.1. ICT Initiatives in Algeria

With the advent of ICT, many countries throughout the world have established different national strategies for integrating ICT in their schools. Algeria is one of these countries in which the Government is investing a great deal of resources to bring ICT into the schools (Makhlouf, 2017). Therefore, the implementation and management of Algerian National ICT Policy has been mandated to the Ministry of Posts, Information Technology and Communications (MPTIC). At the same time, the Algerian Government has also initiated collaboration with a number of international agencies to enhance the ICT status in the country. For instance, the MPTIC co-operated with the World Bank to develop and implement projects for the creation of the enabling environment and improve the access to ICT while making it affordable to all.

The connection of Algeria to the Internet began with email in 1993. There were two groups involved in this task. The first group called DZNET, based abroad and started in 1989, worked hard by contacting the various network organisations such as EARN and NFS-NET hoping for some help from these organisations. DZNET members focused on the need for and the advantages of having Algerian scientific institutions connected to the outside world via email. The second group which worked inside the country was composed of two independent entities, namely, the Algerian Unix Users

Group (ALUUG) and Centre for Information Science and Research (CERIST), a governmental academic organisation (Djoudi, 2018).

The Algerian Government recognised the need for integrating ICT at the level of all Higher Education Institutions (HEIs). The use of distance education which is also growing in Algeria, opened a new model of education. The Ministry of Higher Education and Scientific Research (MoHESR) is among those organisations that suggested the use of online learning and d-learning systems in Algeria. The following governmental bodies were involved with this project in Algeria: Ministry of Posts, Information Technology and Communications (MPTIC), Ministry of National Education (MoNE), and Ministry of Vocational Training (MoVT).

The Government of the Republic of Algeria has embarked on a number of ICT initiatives to support ICT integration in Education. In this regard, to facilitate the entry of Algeria into the '*Information Society*', the following national ICT initiatives have been designed (Ghomari, 2015; Hamdy, 2007):

1. The Project of the Ministry of Education to equip all schools with computers by 2005.
2. The connection of Educational Institutions under the Ministry of Culture to the Internet project in 2012,
3. The Ousra'TIC project (Computer for Every Home Initiative) in 2006,
4. The Tempus ID@A project of e-learning (2005–2008),
5. The Academic Research Network ARN in 2012,
6. The distance education project. The technology-enhanced learning projects
7. The Virtual University project,
8. The Research network to be put in place by the Ministry of Higher Education and Scientific Research,
9. The Health network developed and maintained by the National Health Development Agency (ANDS), and
10. The Djaweb Internet platform.

In the national ICT policies of several countries (notably Algeria), there is a declared intention to become a regional ICT service hub (Farrell & Isaacs, 2007).

In the last few years, the Algerian Government has taken many steps to boost the Information and Communications Technology (ICT) sector in the country by investing heavily in ICT infrastructure and promoting ICT use in organisations and workplaces across the country. Higher Education Institutions (HEIs) in the country are expected to

lead the way in developing an ICT-based framework. Despite the extensive efforts and investments made by the government in promoting ICT use in HEIs, many studies have pointed out that Algerian Universities are lagging behind in the adoption of these technologies.

In line with the potential of information technology to improve teachers' teaching, the Algerian Government has established a pedagogical online platform of Learning Management System (LMS) Moodle for the benefits of all teachers and students at the level of Higher Education Institutions since 2016 to promote research and development in Science, Technology and Education. The Government was not able to sustain those institutions financially, thus, becoming academically unviable. Furthermore, the lack of a policy on information technology, its acquisition and use, has led to failure of computer technologies to produce the desired results in most academic fields including education.

Recently , the Algerian Government has launched several IT projects such as Cyberparc which is dedicated to Information Technology and Communication (ICT) in the new town of Sidi Abdallah near Algiers (Dhaou & Abdessemed, 2010). Besides, many initiatives have been taken as a part of the e-commission chaired by the Head of Government that aims at creating a Government Intranet Network (RIN), and many electronic applications within the framework of e-commerce, e-learning, e-justice e-health, e-services, and e-culture (Dhaou & Abdessemed, 2010).

According to Benamra's (2021) *New and social media in Algeria,* three clusters of key variables largely impacted the diffusion pattern: the partial opening of the telecommunications sector to Internet service providers (ISPs), the proliferation of cheaply accessible cybercafes, and the launch of asymmetric digital subscriber line (ADSL) service in November 2003. The Internet and related technologies are exclusively state-managed sectors controlled by the Ministry of Post-offices and Telecommunications and concretely micromanaged by the Regulatory Authority of Posts and Telecommunications (RAPT) and the state-owned enterprise Algérie Télécom.

Since the Algerian Educational system is highly centralised, ICT-related University policies are linked to national policies as developed by the Ministry of Higher Education

and Scientific Research (MoHESR). The Ministry promotes ICT use, but links this explicitly to the prescribed national curriculum, the central examination system and teacher-led didactical strategies. This does not invite a thorough reflection on school-based policies. Educational policy in Algeria goes through three main phases before it is practised on the ground: policy formulation, policy adoption, and policy implementation. It specifically starts with defining the issue, then setting the agenda and formulating the policy to be adopted and then implemented. The question arises to what extent the definition and implementation of these ICT policies is sufficiently linked to the educational practices in Higher Education Institutions and classrooms. An ICT policy itself does not automatically result in the adoption of innovations unless all actors involved are clearly aware of this policy.

The Algerian Government is actively adapting itself to the need of international competition in the circumstances of globalisation, and also fully understands that informationisation is the general trend of the development of the present world as well as the important power that promotes the economic and social reform.

2.5.2.2 ICT Adoption in the Higher Education Institutions

In accordance with the growing interest in ICT and its advantages for language learning, most countries have invested large sums of money to the integration of technology in schools (World Bank, 1995). The Algerian Government has also remarked the importance of educational technology and allotted a considerable amount of money as an initial strategy to improve the diffusion of ICT in the Tertiary Education System based on three actions: modernising the Tertiary Education Administration, promoting the use of ICT as a support to research and teaching, and encouraging the establishment of ICT as an independent field of research. In fact, the use of Information Technology in education in Algeria started with the establishment of the first Internet Service Provider 'Scientific and Technical Information Research Centre (CERIST)', under the supervision of the Algerian Ministry of Higher Education and Research in 1986 (World Bank, 2003, p. 47).

In parallel with the growing interest and huge investment in educational technology, some studies were conducted in order to investigate the integration of technology in Algerian educational context. Also, some studies related to the incorporation of

technology in language instruction were also carried out to explore the impact of Information and Communication Technology (ICT) on Teaching and Learning in Algeria. To illustrate, Nedjah (2010) conducted a descriptive and analytic study in order to provide insights on the nature of EFL teachers' beliefs and attitudes toward the incorporation of e-learning into their teaching, and to define the different factors influencing them in the EFL departments of five universities in Algeria. The results of the study revealed that the regular use of technology influenced positively both teachers' attitudes and perceptions as an effective teaching tool. Teachers with 10 to 20 years of teaching experience perceived e-learning implementation most positively as valuable in EFL instruction. Genre, age, educational level and University affiliation did not significantly influence teachers' attitudes and beliefs toward e-learning integration into English language teaching.

The Ministry of Higher Education and Scientific Research (MoHESR, hereafter) is the department responsible for the development and the progress of the academic sector and scientific research in Algeria. In this regard, the Ministry has created two institutions: The Research Centre on Scientific and Technical Information (CERIST) which was founded in 1985 with the primary objective to implement programs of scientific research and technological development in the field of Information Science and Technology. The General Directorate for Scientific Research and Technological Development (DG-RSDT) that came into being in September 2009, and was set up by law # 08-05 of February 23, 2008, which defines the five-year national Scientific Research Plan (2008–2012), expected to move the Algerian research system to excellency for a sustainable development. By this law, the DG-RSDT is the principal enabler of national scientific research and development (Benouar, 2013). As far as Education is concerned, ICT has been introduced into the Algerian educational system from the late 1990s (Ghomari, 2015).

Nowadays, Algeria is witnessing a significant shift in its University system with a growing number of students from year to year due to its youthful population and a dynamic transition into the integration of Information and Communication Technologies (ICTs). The use of ICT by teachers and students raise important reflections (Kouninef, Djelti & Kourbali, 2013). Hence, the integration of this technology into the

educational process has become an unavoidable necessity for the learner and instructor as well as for the academic institutions to absorb the large number of students (Kouninef et al., 2013).

A series of governmental decisions in Algeria helped the dissemination of technology across a large range of educational institutions under the provision of hardware, personal computers and ICT laboratories with the goal of achieving the potential benefits of teaching and learning through ICT, and making in this way ICT an integral part of the curriculum (Ghomari, 2015). Unfortunately, the enthusiasm underlying the acceptance and use of ICT at the level of Higher Education Institutions did not last due to the obstacles encountered when attempting to integrate it into daily teaching and learning practices of teachers.

Higher Education in Algeria has experienced huge transitions toward openness and quality. In the last decade, tremendous efforts have been made by the Algerian Government to further enhance quality of education through the effective use of ICTs, e-learning and e-training. While lot of progress has been made as compared to the beginning of this millennium, ICT and e-learning in Algeria remains at inadequate levels of exploration and deployment (Dhaou & Abdessemed, 2010). For instance, the Algerian researchers Kouninef, Djelti, and Kourbali (2013) presented in a research paper entitled *Appreciations and Constraints for ICT Use in Higher Education in Algeria* some aspects concerning the conditions and constraints related to the use of ICT in Higher Education in Algeria. Furthermore, Kouninef, Djelti, and Kourbali (2013) discussed the basic infrastructure elements that can contribute significantly to the integration of ICT in Higher Education. The research, set in Algeria, adopted a descriptive and analytical methodology. Data were analysed qualitatively and quantitatively. The finding showed that the constraints and difficulties related to the integration of ICT in the Algerian Higher Education are mainly due to a lack of infrastructure and support. In a similar vein, Hamdy (2007) wrote a report on the core factors and summary of the current stage of development in Algeria in terms of enabling or constraining ICT applications in the Education system as shown in Table 2.1.

Table 2.1: Factors Influencing ICT Adoption in the Algerian Educational System

Factors	Enabling Features	Constraining Features
Policy framework	A national ICT policy for educational development was set forth in 2002. The government has adopted ICT in all domains, particularly the education sector, as an integral part of the development process.	The policy for ICT exists, but to be successfully implemented it needs strong infrastructure and resources. Vast areas of Algeria are still lagging behind in basic needs. Algeria
Infrastructure and access		Algeria faces problems of poor infrastructure and connectivity issues.
Availability of appropriate learning materials	The development and provision of tools and learning material are at the heart of the policy of ICT for educational development.	There are not enough appropriate learning materials.
Rural/urban divisions	A major concern of the national ICT policy is provision of access and connectivity to all areas of the country.	Few schools and even fewer universities and higher institutions are available in rural communities.
Gender equity	A number of development projects, especially non-formal education programmes, are directed towards females being part of the underserved population.	In general, the level of illiteracy is higher among females and this is reflected in their access to ICT as well as training and skills.
Human resource development		The multilingual base in Algeria poses a major hurdle to unifying or implementing programmes at a large scale. Professional development programmes and teacher training is still limited to basic ICT training with no connection or relevance to integration into the educational process. Professional development and ICT programmes lack connection with content and curriculum development in a manner that allows for proper implementation of reform. The disconnection among the different development programmes impedes proper impact and progress.

The factors enabling and constraining ICT applications are essentially the same in both developed and developing economies, although they obviously differ in terms of importance, depending on which side of the digital divide they are viewed from (Farrell & Isaacs, 2007). Thus, what differentiates the rate of adoption and diffusion of ICT in the field of education is not the factors at play, but rather the degree to which they have been developed or are present in a given country.

The Algerian Government had also allocated a special budget for the online training of newly recruited teachers at the level of Higher Education Institutions in Algeria and they were given six months of an online training that is held by Mentouri Brothers Constantine University1 (UFMC). Such training is essential to give the teachers the confidence and the necessary skills to enable them to actually use the ICT in their classroom practices.

In the Algerian Higher Education Institutions (AHEIs), the Learning Management System (LMS) that is made available to the learners included Moodle LMS. The Web based system of Moodle LMS can fully support a distance learning environment or act as a supplemental site for face-to-face (F2F) learning or can provide a hybrid course through a blended learning environment. For this reason, the recent Algerian Minister of Higher Education emphasised on the integral role of using the online Learning Management System (LMS) of Moodle, especially with the unusual circumstances for the unexpected closure of all Higher Education Institutions due to the outbreak of Covid-19. Thus, teachers are highly required to upload their courses online in the pedagogical platform of Moodle LMS in parallel with the face-to-face learning for the benefits of learners in the academic year 2020–2021. In line with this, teachers should be ready to adopt and use computers and students should benefit and be geared toward the realisation of a new vision of distant and blended learning. The huge investment on university teachers is also anticipated to create a technologically literate workforce who in turn would generate a future generation that would be competent and confident to perform in a global, IT-intensive work environment. However, in the educational settings, one of the major obstacles faced is the non-extensive usage of computers by the educators for classroom teaching practices. Clearly, something should be done to identify the root cause of this problem. Although teachers are provided with training to

gain knowledge and skills in the Actual Usage of Computer (AUC) and ICT equipment, many have returned only to fall back onto their traditional mode of teaching.

After many years of national policies and investment in Information Technologies in Algeria and elsewhere, technology is still an imposed and novel 'outsider' in the pedagogy of Higher Education Institutions. In a report by Hamdy (2007) stated that the development of ICT infrastructure and its integration into education is one of the key components founded in the development plans of Algeria.

Regarding what developed countries have gained in integrating ICT in Education in general and Higher Education in particular; introducing technology in the Algerian Higher Education has become a necessity to improve this fundamental sector. Therefore, the amalgamation of technology has turned into an essential component that the academic community should strive to save.

2.6. Issues of ICT Integration in Teaching and Learning Process

2.6.1. Theoretical Lens: ICT and Language Teaching

Educational technologies are becoming increasingly important and promise to change the way students learn and teachers teach. However, technology has been used in language teaching for decades. For example, according to Dudeny and Hockly (2008), the blackboard, as a form of technology, has been used for centuries. Tape recorders, language labs and videos have been in use since the 1960s and 1970s, and are still used in classrooms around the world. The key to successful use of technology in language teaching lies not only in hardware or software but also in our human capacity as teachers to plan, design and implement effective educational activities. This, of course, can help bring out the best that human and machines have to offer (Abunowara, 2014). Roblyer and Edwards (2000) proposed five reasons for teachers to use technology in Education: (1) motivation, (2) distinctive instructional abilities, (3) higher productivity of teachers, (4) essential skills for the Information Age, and (5) support for new teaching techniques. However, despite the rapid pace of change in the educational technology landscape for Higher Education, several research studies continue to show that the level of technology integration and its impact in the classroom remain low. For instance , Holkner et al., (2008) indicated that:

> *After nearly five decades of computers in education there is still confusion about the use of technology in classrooms and widespread reluctance to move beyond tokenistic use. There is not a universal, shared vision regarding the use of technology in the classroom and teachers are confronted with many theories and instructional designs and bombarded with con- fusing, even romantic views of what the technology is capable of delivering* (Holkner et al., 2008, p. 3).

A considerable body of literature spanning over two decades has indicated similar views. Many teachers have not moved beyond "basic" pedagogical uses such as PowerPoint presentations, YouTube videos, word processing and Internet search. Moreover, researchers are increasingly questioning the value of effective use of technology in the classroom. There is a need to know more about how existing and emerging technologies are impacting on classrooms.

As a branch of ICT use in Education, Computer-Assisted Language Learning (CALL) has been in use for decades(Hu & McGrath, 2011). Its history, which can be traced back to the 1960s, can be divided into several periods: the 1960s–1970s (Behaviourist CALL), the 1980s (Communicative CALL), and the 1990s–present (Constructivist/Integrative CALL)(see Fitzpatrick et al., 2004; Fotos & Browne, 2004; Warschauer & Healey, 1998,for a detailed discussion). When language teaching and technology is concerned, CALL has been the most widely used expression, and it has progressed substantially particularly for the past four decades. Computers-based materials for language teaching, often referred to as CALL (Computer Assisted Language Learning) were introduced to the language learning field in the 1980s (Dudeney & Hockly, 2007, p. 7) and many enthusiasts strongly advocated their use, espousing the many advantages they could bring to both language learners and teachers. The CALL approach is one that is still found on many published CD-ROMs for language teaching.

Computers have been used systematically in the teaching and learning of foreign languages (FLT/FLL) in universities since the 1960s, but it was with the introduction of the personal computer (PC) in the late 1970s that made computers accessible to a wider audience(Fitzpatrick et al., 2004).Hence, the use of computer technology in the field foreign language teaching is intertwined with the use of Computer-Assisted Language Learning (CALL).In a well-recognized review of CALL-related research, Warschauer and Healey (Warschauer & Healey, 1998) pointed out that each of the above three stages

of CALL corresponded to advances in technology and to pedagogical approaches. Therefore, in the eyes of many educational technology specialists, the role of the computer in education has gradually been transformed from that of *tutor* to that of *tool* (Warschauer, 2002). This is certainly the case in the field of foreign language teaching, in which the most dynamic applications of computer-assisted language learning (CALL) involve simulations, electronic communication, and multimedia production rather than simple drill-and-practice tutorials (see examples in Egbert & Hanson-Smith, 1999). The main argument here is that this new role of technology is challenging traditional designs of education policies and their components, highlighting the need to change the traditional question from how to use ICT to transform education, to a new one that asks how to teach and learn in a transformed digital context .Up until now most CALL literature has been technology driven ,Hence, Joy Egbert and Elizabeth Hanson-Smith's (Egbert & Hanson-Smith, 1999)book '*CALL Environments: Research, practice, and critical issues"* fills the gap by offering practical suggestions to adapt computers for language learning instead of just showing the types of activities computers can do.

Today, experts in the field prefer to talk about Information and Communication Technology (ICT) and FLT/FLL rather than CALL, emphasising the important role that computers play in enabling teachers and students of languages to engage in world-wide exchanges and communication(Fitzpatrick et al., 2004). Thus, bringing ICT into the classroom can have a considerable impact on the practice of teachers especially when ICT is conceptualised as a tool that supports a real change in the pedagogical approach(D. Harrison, 2010).

Teachers' uses of technology are rarely linked to the student learning outcomes they are designed to facilitate (Lawless & Pellegrino, 2007).It is time to shift our mindsets away from the notion that technology provides a *supplemental* teaching tool and assume, as with other professions, that technology is *essential* to successful performance outcomes (i.e., student learning). ICT-mediated learning became an integral component of education and training systems. Moreover, with the rise of Information and Communication Technologies era, new competencies became vital. Digital literacy, the ability to use ICT, is one of the most important (Ceobanu et al., 2010).To put it simply,

effective teaching requires effective technology use(Ertmer & Ottenbreit-Leftwich, 2010).

Indubitably, Information Technology (hereafter, IT) is not only perceived as a catalyst for change, but also change in teaching style, change in learning approaches, and change in access to information. Yet, research indicates that teachers are both threatened by change, and conversely not impressed by change that appears to focus on what the technology can do rather than on learning(Watson, 2001). Indeed, the use of computer-aided technology in the classroom will, no doubt, inspire the teachers to approach their tasks with a greater sense of purpose and, more importantly, a sense of play to make the learning process fun for students.(Kumar et al., 2008c). Being prepared to adopt and use technology and knowing how that technology can support student learning must become integral skills in every teacher's professional repertoire(Kumar et al., 2008c).

Teachers are the key persons to use of Information and Communications Technologies(ICT) in educational settings productively and to help integrate ICT into the curriculum (Usun, 2009). It should be accepted that teachers are the key players in changing the educational world, and in particular at improving the learning and teaching processes in their own classrooms(Levin & Wadmany, 2008).Moreover, ICTs at Higher Education Institutions will have little impact if teachers are not actively involved in all phases of their integration to the curriculum .Thus, the role of the teacher at this point is vital. Teachers are required to decide how to make appropriate educational use of ICT in the classroom, where there are no longer lecture-based or didactic teaching methods in classrooms any more(Usun, 2009).

Teaching is a complex activity, and teachers' choices at the technology-pedagogy interface are determined by a wide variety of factors. Researchers and policy makers need to understand the relationship between teacher preferences, pedagogy and educational technologies to ensure quality teaching and learning(Aubusson et al., 2014).

After many years of national policies and investment in Information Technologies in Algeria and elsewhere, technology is still an imposed and novel 'outsider' in the pedagogy of higher education institutions.

To better understand more about the role of teachers' knowledge and how it could enhance successful ICT implementation, the next section (Section 1.6.2) will discuss an important theoretical framework, that is, the Technological Pedagogical and Content Knowledge theory.

2.6.2. ICT Integration in ELT Classroom and Teacher Pedagogical Orientation

The evolution of new technologies in the field of Education in general and in English Language Teaching (ELT) in particular has attracted increasing research interest worldwide during the past decades. This research is constantly evolving, especially since technology itself is also evolving at a rapid pace and new devices, solutions, and practices are becoming increasingly available. This extensive research interest in the potential of technology to support learning has led to a considerable body of knowledge. According to Karagiannidis, Politis, & Karasavvidis(2014) , many issues still remain open such as:

- How can the new Web 2.0 tools support learning in different educational settings?
- How can technology be used to support learning in other cultural institutions?
- How can teachers use ICT to improve teaching and learning practices?

One important question for the present section focuses on whether the general pedagogical orientation of a teacher would influence the likelihood of him or her adopting ICT when teaching.

The integration of ICT into teaching and learning is first and foremost about pedagogy, about creating an environment for students' activities that leads to meaningful and sustainable learning experiences. Thus, teachers occupy the central position in strategies for using technology in relation to good pedagogy for improved education. The role of a teacher will change from that of a knowledge transmitter to that of a facilitator, knowledge navigator, co-learner and courseware developer all rolled into one. This new role does not diminish the importance of the role of the teacher but requires news ways of thinking that will culminate in ICT-enhanced pedagogy (Majumdar, 2005). ICT use in Education requires reconsideration of teachers' role orientation (Mumtaz, 2000).Effective pedagogical strategies meant to develop ICT

integration programs in schools should focus on making a shift from teaching technology, or using technology for administrative purpose to the use of technology for pedagogical ends (Kafyulilo & Keengwe, 2014) .Hence, the burden of bridging this gap between technology and teachers is placed squarely in the laps of teachers. They face the daunting task of not only using the technology, but also showing the expected benefits of its use. To this point, Plomp, Pelgrum, and Law (2007) suggest,

> *In order to assess the use of ICT in pedagogical practices it is necessary to elaborate the concepts 'teaching and learning' as well as 'use of ICT' and define how these concepts are related. Moreover we need to elaborate concepts such as vision on education, teachers' knowledge and skills of ICT, the availability of content and the hardware infrastructure (Plomp et al., 2007, p. 85).*

Undoubtedly, the teaching and learning of foreign languages has been undergoing a great upheaval in the past decades with the advent of new Information and Communication Technologies in general (ICT) and those for Education in particular. Hence, ICT in the ELT classroom today is unavoidable as it is now a part of our daily life (Asnawi et al., 2018).Learners today are have different objectives and needs. Today's learners seem to be totally immersed in technology. The ubiquity of technology has led to the development of generational labels focused on technology such as the "Digital or Net Generation" (Tapscott, 1998) , Generation Y (Black, 2010) , "Digital Learners" (Lai, 2018), and perhaps most commonly, Digital Natives (Prensky, 2001), or in terms of other portrayals of expert technology users. The use of these labels may lead to broad assumptions about young people's propensity or capacity to use technology in a professional, and educational setting(Bannerman & O'Leary, 2021), who are growing up with new technologies as a non- remarkable feature of their life (Scherer et al., 2019). They spend significant periods of time in front of the computer wearing the internet with, forums, laptops, tablets and other technological means. Incorporating technology in the learning/teaching process of English has become a novel and momentous trend in foreign language education all over the world(Babou & Abdelhay, 2019). More specifically, technology has added new dimensions to the nature of English as a Foreign Language (EFL).

Without skills and understanding of how a piece of technology functions, it is not possible for educators to implement effective pedagogy that incorporates the

technology. According to Ng (2015), the question for educators using technologies in their teaching is whether it is pedagogy first or technology? While the rhetoric is usually: 'It's about the pedagogy, not the technology' or 'it's the teach, not the tech', I would argue that it's neither pedagogy nor technology first (See Figure 2.4). Hence, integration of ICT with pedagogy improves the efficiency, effectiveness and quality of teaching and learning processes in a significant way (Majumdar, 2005).However, the issue of its integration in the language classroom is still a topic of great discussion in the field of language education.

PEDAGOGY

Technology

Figure 2.4 The Interdependency of Pedagogy and Technology (Ng, 2015)

Furthermore, the most crucial factor in integrating ICT into the teacher education depends on the extent to which various guiding principles of the integration are formulated and applied. While using ICT for creating a new learning culture, one has to bear in mind the current social and economic conditions, existing telecommunication infrastructure and cultural and linguistic factors. Figure 2.5 illustrates an overarching framework proposed by Anderson (Majumdar, 2005) that demonstrates the levels of activities within the classroom that relate to ICT integration in the context of this study.
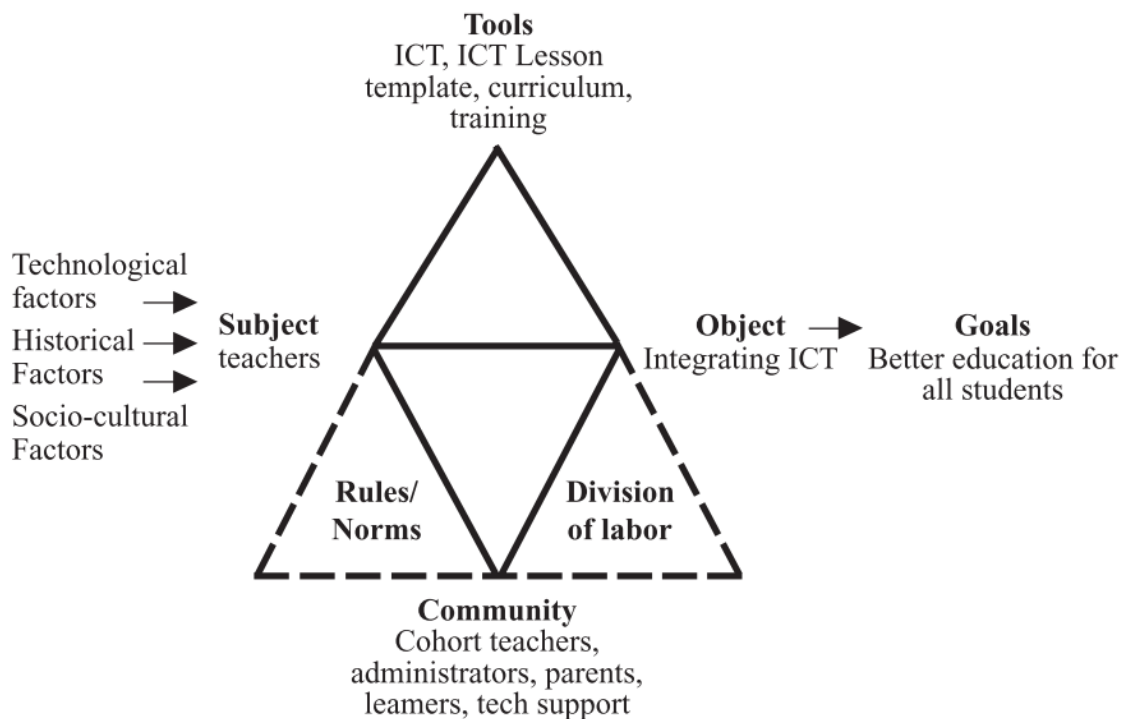
Figure 2.5 An Overarching Framework for Linkages between Teachers and the Surrounding Community (Majumdar, 2005)

The above framework shows a linkage between teachers moving towards ICT integration and ultimately higher quality education, mediated and supported by the tools available (ICT, curriculum, guidelines, training, people support, policy etc.,) and the surrounding community (colleagues, administrators, parents, learners etc.). Teachers are required to use ICT so as to fulfill the cherished goal based on four pillars of education: (1) learning to know, (2) learning to be, (3) learning to live together and (4) learning to do. Therefore , a number of guiding principles and strategies need to be employed in planning and implementation of various activities of ICT integration(Majumdar, 2005).

When considering ICT implementation into classroom practices, teachers are faced with the challenge of how to successfully achieve this implementation to facilitate students' learning (Al Harbi, 2014). The previous section indicated that the successful use of technology in language teaching required a new knowledge form the side of teachers. Teachers must have a coherent understanding of how ICT can be used combined with knowledge of subject matter and teaching strategies to raise the chances of effective learning. The Technological Pedagogical Content Knowledge (TPACK)

framework provides this combined understanding. In a similar vein , Ghomari (2015) highlights,

> *The need for designing a framework that accounts for psychological, pedagogical as well as technological/organizational considerations for successful ICT integration in a foreign language teaching/learning environment seems to us necessary if one is to expect pedagogy to be transformed and learning to be enhanced and local economy to be developed (Ghomari, 2015).*

Learning and related ICT use cannot easily be disambiguated from the context in which it occurs. To that end, technology integration is a systemic endeavor that integrates technology, pedagogy, and content in the service of achieving learning goals (Dennen et al., 2018).The TPACK Framework brings together three areas of knowledge (content, pedagogical and technology) and explores how these three constructs relate to each other and overlap in the service of effective integration of ICT in the classroom (Mishra & Koehler, 2006). One dimension of TPACK is Technological Pedagogical Knowledge (TPK), or knowledge of how to use technologies in support of learning. Teachers with strong TPK can effectively use technology in ways that enhance learning and make decisions about technology integration that are responsive to different types of teaching activities and learning outcomes (Schmidt et al. 2009 as cited in Dennen et al., 2018). Besides, while UTAUT TAM is a technocentric model for ICT acceptance, TPACK supplements the understanding of teachers' ICT use with more pedagogical concerns of teachers' ICT knowledge (Harris et al., 2009 as cited in Li, 2021). A mere learning of ICT skill is not enough, but using ICT to learn and improve teaching and learning is the key for pedagogy-technology integration. Pedagogical expertise is at the heart of teaching as a profession, and, therefore, ICT has to be used in conjunction with pedagogy (Majumdar, 2005). In particular, how EFL teachers use ICT is strongly related to how they perceive the easiness of using ICT, and to what extent teachers could integrate ICT in their pedagogy and content teaching is associated with their perceptions of ICT usefulness (Li, 2021). With the inclusion of content knowledge, teachers can make these technology integration decisions in a manner that is appropriate for English Language Teaching.

Scholars have argued that teachers' use of ICT for teaching and learning is highly influenced by their pedagogical beliefs (Ertmer & Ottenbreit-Leftwich, 2010;

Ottenbreit-Leftwich et al., 2018).For instance, Himsworth (2007) studied the relationship between the use of Information Technology (IT) by teachers in their teaching practices and their pedagogical beliefs from three suburban New York school districts. Results of the study demonstrated that teachers whose pedagogical beliefs were more flexible and democratic in nature use IT-based tools in their teaching more frequently than teachers who have more traditional pedagogical and authoritative beliefs. These results were later confirmed by Ertmer & Ottenbreit-Leftwich (2010). A better understanding of pedagogical beliefs of teachers is then essential for the transformation of teachers' instructional practices to improve student learning outcomes(Lim et al., 2014).However , Aubusson et al., (2014) point to the complexity of factors mediating pedagogical use of technology, as well as to the range of factors that influence teachers' decisions to adopt technology in the first place.

The impact of the pedagogical beliefs of teachers on classroom practice has been well-documented (Mueller et al., 2008; Lim et al., 2014; Dennen et al., 2018) but the direct influence of pedagogical beliefs for the integration of computers is not as clear .Pedagogical beliefs have great influence over if and how teachers choose to integrate technologies into their classroom practices. Teachers tend to choose technologies that both support their beliefs and their prior experiences (Tondeur et al., 2016) .They can be supported in their technology integration endeavors by the provision of examples, support, and professional development that are aligned with their existing beliefs(Ertmer & Ottenbreit-Leftwich, 2010).Thus, teachers' pedagogical beliefs are reported in the literature as one of the major factors determining whether they integrate technology into their teaching practices (Ertmer et al., 2012; Hsu, 2016; van den Beemt & Diepstraten, 2016).

Technology usage in the learning environment is more likely to improve when the pedagogical approach of the teacher is consistent with the given technology(Zalah, 2018). In general, when teachers are asked to use technology to facilitate learning, some degree of change is required along any or all of the following components or dimensions: (a) beliefs, attitudes, or pedagogical ideologies; (b) content knowledge; (c) pedagogical knowledge of instructional practices, strategies, methods, or approaches; and (d) novel or altered instructional resources, technology, or materials (Fullan, 2007).

In this respect, research on educational innovations suggests that technology integration can only be fully understood when teachers' pedagogical beliefs are taken into account. More specifically, on the basis of their beliefs, teachers choose specific teaching strategies and tools, including technology, to incorporate into their classroom practices(Lim et al., 2014).In other words, the role technology plays in teachers' classrooms relates to their conceptions of the nature of teaching and learning.(Tondeur et al., 2016).To this point, Law and Chow (2008) indicated,

> *Teachers with a stronger traditionally important orientation were the teachers least likely to be using ICT in their teaching whereas those teachers with a stronger 21st century orientation (i.e., the lifelong learning and connectedness orientations) were the teachers most likely to be using ICT in their teaching (Law & Chow, 2008).*

For teachers, the reasons for and the ways of using ICT in the classroom are underpinned by their overall pedagogical vision and competence.

Overall, the literature suggests that there are four primary dispositional factors associated with teachers' uses of ICT for teaching and learning: self-efficacy, or a belief in one's own capability to use ICT to support teaching/learning; attitudes, or the extent to which teachers value ICT use or find it beneficial; pedagogical beliefs, or beliefs about teaching and learning and the role of technology in the teaching-learning process; and openness to change, or a willingness to incorporate new technologies or try new approaches to teaching with technology(Ottenbreit-Leftwich et al., 2018). In North Africa and some Arab countries, for instance, a major focus needs to be placed on the pedagogical integration of ICT into teaching and learning processes(Eickelmann, 2018).Using the potential of technology in educational practice often implies that the role of the teacher has to change. The teacher not only has to learn the basic knowledge and skills of ICT, but more importantly, has to learn appropriate pedagogical skills to be able to integrate, and use ICT in an efficient way into educational practice. Thus, research reveals that integrating ICT among teachers in the classroom is a complex and multifaceted process of educational change (Fraillon et al., 2014; Ottenbreit-Leftwich et al., 2018) and still remains a major concern in the education sector today (Batchelor & Olakanmi, 2015).

Efforts should be made to develop teachers' technological knowledge, skills and ability of using ICT in the classroom so as to enhance their confidence in teaching with

technology (Kafyulilo & Keengwe, 2014). Teachers play a crucial role in the adoption and implementation of ICT in education since they are the key to making learning happen (Pelgrum & Law, 2003). On the whole, there is a need to address the challenges of pedagogical integration of ICT into the curriculum(Namalefe, 2010).However, the question remains as to what degree and how teachers integrate technology into teaching and learning activities.

2.6.3. Areas for Investigation–ICT, Teacher Training and Professional Development

Teacher professional development is said to play an important role in improving the quality of teaching and learning in any educational context. Terms used to describe the development of educators professionally include 'professional development', 'continued professional development', 'professional learning' and 'teacher learning'(Ng, 2015). More commonly used are 'professional development' and 'continuous professional development (CPD)' that often appear to be used interchangeably to mean the same thing in much of the literature on developing teachers professionally. Describing a similar definition of professional development – also called 'ongoing' continuous professional development (CPD) (Fullan, 2007) – Coldwell (2017) writes:

> *By professional development (PD), I mean formal and informal support and activities that are designed to help teachers develop as professionals. This includes taught courses and in-school training, as well activities such as coaching, mentoring, self-study and action research (Coldwell, 2017, p. 2).*

While Coldwell (2017) focuses on the professional development (PD) of active teachers, Avalos (2011) likewise claims that professional development is about teachers learning, learning how to learn, and transforming their knowledge into practice for the benefit of their students' growth. Ng (2015, p. 27) considers PD as the processes and context-specific activities that are designed and delivered to enhance the professional knowledge, skills and attitudes of educators. According to Ngeze (2019), teacher professional development (TPD) covers as all activities that develop teacher's skills, knowledge and expertise. TPD involves structured professional learning activities that improve the teaching practice, leading to improved student outcomes.

There is a growing body of research that focuses on either internal or external professional development (Drossel & Eickelmann, 2017; Morris, Chrispeels & Burke, 2003). A distinction is made between internal and external professional development: the former involves further training within the school setting whereas the latter comprises participation in external training activities (Drossel & Eickelmann, 2017). Morris et al. (2003) argue that while both forms are independent of each other, 'linking the two doubles the power of each'. It is worth noting that Fraillon et al. (2014, p. 39) make a distinction between pre-service and in-service professional development. In the context of this research, focus will be mainly on in-service professional development. However, the distinction between internal and external development has resulted in a lack of agreement among researchers as to which is more effective in regard to the character of professional development activities. Morris et al. (2003), however, consider a combination of both external and internal professional development to be most effective, finding that the 'two emerging approaches to professional development, when systematically linked, can provide the transformative power to alter professional development and teacher learning in profound and sustainable ways.'

Across Africa and most developing countries, there are many challenges in bringing ICTs into teacher training and the education process in general. Anderson (1997, as cited in Harrison, 2010) identified a range of factors that affect ICT use by teachers, including many of those related to educational factors such as levels of teachers' own education and literacy rates and access to professional development. Meanwhile, it is observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. However, most of these studies were carried out in developed countries where the use of ICTs has come of age, and where there are resources and material to maintain them (Tella, Tella, Toyobo, Adika & Adeyinka, 2007).

As described by Collis and Jung (2003), there are a variety of approaches in ICT-Pedagogy integration in teacher training. Figure 2.6 shows these approaches using a four-cell matrix. It is worth mentioning that a majority of the countries in the world have provided ICT teacher training in a variety of forms and degrees after having recognised the great importance of ICT in teaching and learning.

Core
Technology

ICT as main content
focus

ICT as core delivery
technology

Learning
How to
Use ICT

Learning
VIA ICT

ICT as part of content or
methods

ICT as facilitating or
networking technology

Complementary
Technology
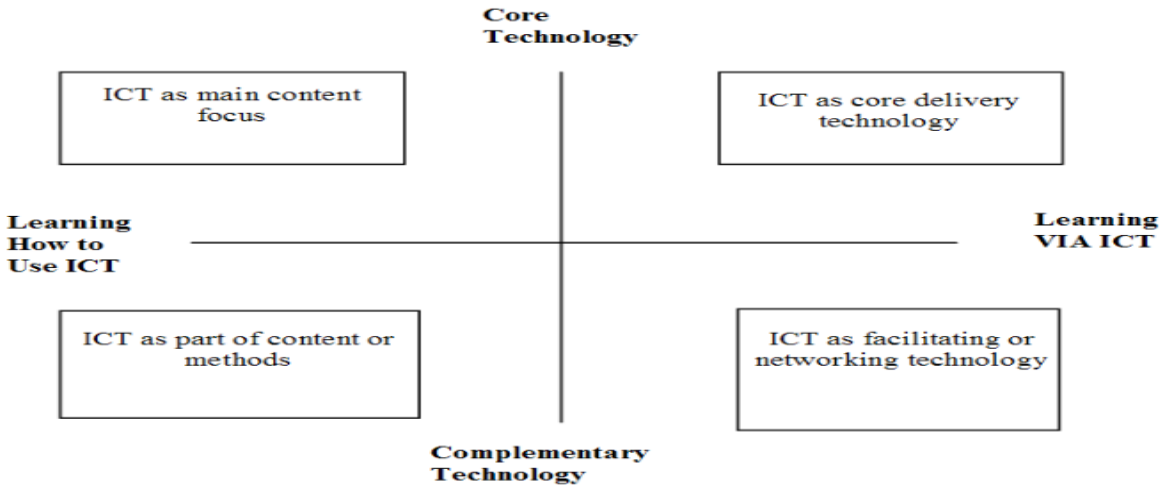
Figure 2.6 ICT-Pedagogy Integration in Teacher Training (adapted from Barakabitze et al., 2019, p. 10)

As shown in Figure 2.6, ICT teacher training can take many forms. For example, teachers can be trained to learn how to use ICT or teachers can be trained *via* ICT. From the perspective of being used as a tool, ICT can be used as a core or a complementary means to the teacher training process. ICT as a core technology for delivering teacher training can be used as the major way of providing the learning experience of teacher training. In that aspect, the content of this approach does not necessarily focus on ICT skill itself but rather covers a variety of ICT applications. One example of this approach is the Computer-Assisted Teacher Training (CATT) project developed computer – assisted teacher training courses and constructed communications network for the facilitation of interaction among teacher trainers, teacher trainees, and inspectors in Morocco and Namibia, [59]. Experience around the world in developing, industrialised and information-based countries has demonstrated that teacher training in the use and application of technology is the key determining factor for improved student performance (Guemide, Benachaiba & Bouzar, 2011). To this point, Guemide et al. (2011) further pointed out:

> *Educational technology is not, and never will be, transformative on its own – it requires teachers who can integrate technology into the curriculum and use it to improve student learning. In other words, computers cannot replace teachers – teachers are the key to whether technology is used appropriately and effectively (Guemide et al., 2011, p. 87).*

The integration of ICT in Education shall not be technology-driven since ICTs are only tools. A mere learning of ICT skill is not enough but using ICT to learn and improve teaching and learning is the key for pedagogy-technology integration. According to Wright (2000),'Pedagogical expertise is at the heart of teaching as a profession'. Therefore, ICT has to be used in conjunction with pedagogy. Developing an appropriate range of pedagogical skills in using ICT shall be a process of long-term experiential learning, rather than short-term theoretical learning. This requires initial teacher education with built-in key technology elements, in-service teacher training and ongoing support for professional self-development, with teachers taking greater responsibility for core competencies in technology-pedagogy integration (Majumdar, 2005).

In Unwin (2005)'s *Towards a Framework for the Use of ICT in Teacher Training in Africa*, six main principles of good practice must be addressed for the successful implementation of teacher training programmes that make advantageous use of appropriate ICTs: (1) a shift from an emphasis on 'education for ICT' to the use of 'ICT for education'; (2) an integration of ICT practice within the whole curriculum; (3) a need for integration between pre-service and in-service teacher training; (4) a need for the development of relevant and locally produced content; (5) a need for appropriate educational partnerships; (6) and an emphasis on the development of sustainable costing models. Furthermore, the ways of using ICTs in the field of Education can be clearly divided into two broad categories: (1) ICTs for Education and (2) ICTs in Education (Olakulehin, 2007). ICTs for education refers to the development of Information and Communications Technology specifically for teaching/learning purposes, while ICTs in Education involves the adoption of general components of technologies in the teaching process (more specifically, often for the training of teachers in the use of technology for teaching) (Olakulehin, 2007). In the same vein, UNESCO (2004 as cited in Harrison, 2010) classifies ICT in Education into three broad categories: (1) pedagogy, (2) training, and (3) continuing education.

As Unwin (2005) testifies, a diversity of reasons for the gulf between the rhetoric of those advocating the use of ICT in Education in Africa, and the reality of classroom practice. However, given the very great importance of teacher training, it is surprising that not more emphasis is placed on its enhancement by national governments, donors and civil society organisations alike. Teacher training is all too often neglected in the face of more immediately visible educational goals. It is much easier to build a gleaming new school in an urban community than it is successfully to train a cadre of teachers willing to work in poor, rural areas, far from the centres of social and commercial life of a country.

However, teacher quality is critical and is one of the premises of a successful reform. All serious educational reform efforts are bound to fail if the quality of teachers and their expertise are not taken into serious consideration (Hu & McGrath, 2011; Unwin, 2005). This has become all the more significant with the unusual circumstances in the face of the outbreak of Covid-19 throughout the world. Over and above this, there is a pressing need for teachers with a minimal level of training to have opportunities to upgrade their skills for an online teaching.

In the Algerian context, the Mentouri Brothers Constantine University (UFMC) has set up in 2012, a strategy of training in ICTs and pedagogical practices for the benefit of newly recruited teachers in order to ensure a quality education meeting the requirements of training offers. As stated by Belhani (2021) ,the responsible for the distance education cell at the University of Constantine I, this techno-pedagogical innovation aims to develop in the teacher's skills in the field of educational technologies in order to improve his teaching practices and to introduce him to the different mechanisms of university pedagogy in distance education as well as face-to-face teaching .Such training is meant to ensure quality hybrid education that meets the demands of society in the digital age. Inappropriate training is widely identified as one of the major failings of Higher Education in some Arab countries (Waterbury, 2019).

Today and in order to respond to the Support Program launched by the trusteeship (decree N 932 of July 28, 2016), the University of Constantine (UFMC) is responsible for the online training of teachers of all the Higher Education Institutions of Algeria under the supervision of a team of specialists in the field. The members of the training

team of the distance learning centre of the UFMC come from different training courses namely: the training in ICT provided by the UFMC and which has trained nearly 400 teachers since 2012, the Program PAPS-ESRS, the Master training in educational technologies (ACREDITE) provided by the University of Cergy Pontoise with the support of AUF as well as the program of Cooperation Algéro-Suisse 'COSELEARN' for the training of specialists in e-learning (Belhani, 2021).

In an online Webinar held on June 30, 2020, *Training Newly Hired Teachers in the Higher Education Sector: Reality of the Experience 'Challenges and Prospects',* Belhani Ahmed, responsible for the National Training Cell TIC remotely for newly hired professors in Higher Education Institutions, spoke on the importance of remote training for newly hired teachers and the statistics of teachers formed since the start of the pedagogical accompaniment process for benefits of newly recruited teachers at the level of the Higher Education Institutions in Algeria in 2016 (University of Msila, 2020).

Additionally, a considerable body of literature describes the necessity of accessing to high quality continuing professional development (CPD) for education professionals to retain competency within the ever-evolving worlds of teaching and learning. Recognising the utmost importance of ICT in teaching and learning, a majority of the countries in the world have provided ICT teacher training in a variety of forms and degrees (Jung, 2005). However, it is worth noting that many researchers (Law and Chow, 2008; Pelgrum, 2008) have found advanced training options to focus more on technological aspects rather than on the didactic integration of ICT into relevant scenarios of teaching and learning. The unavailability of relevant options for professional development may thus also play a role here. As a lack of professional competences both at the didactic and methodological level has been found to constitute a hindering factor to the integration of new technologies in class, the professional development of teachers has the potential for taking countermeasures (Drossel & Eickelmann, 2017).

According to Pelgrum and Law (2003), it is easily recognisable that the following factors are essential in any strategy to integrate ICT into the teaching and learning process: provision of access to computers, network and Internet access, training of teachers, provision of ICT-based curriculum resources, and technical support. Hence,

adequate professional development can take the form of observing colleagues, learning from each other, observation of each other's ICT-integrated lessons, as well as the provision of opportunities for teachers to share and collaborate with each other (Divaharan & Ping, 2010).In this regard, Fullan (2002) has highlighted,

> *A key factor in changed teaching and teacher change is support in the form of teacher professional development, which helps teachers learn new roles and teaching strategies that will improve student achievement.*

However, published research on ICT-related teacher CPD in Higher Education is still limited in both scope and quantity. First, the majority of published studies were conducted at the level of Primary or Secondary schools. Second, most studies reported in the literature have focused on teachers in general rather than language teachers (Hu & McGrath, 2011). Only few studies on language teachers at tertiary level to date have examined a large-scale reform/innovation and investigated the external and internal factors which influenced the effective provision of ICT-related CPD for EFL teachers.

Although the use of ICT in language teaching and learning is widely recorded and a positive relationship has been shown between University English teaching using computers and a networked environment and the progress of students' self-directed learning (Z. Hu & McGrath, 2011), there has been a paucity of research focusing on English teachers' professional development, particularly ICT-related CPD (Forrester, Motteram & Bangxiang, 2006). For example, Hu and McGrath (2011) carried a mixed methods study of ICT-related teacher development at a University in Southern China. The study examined EFL teachers' attitudes towards ICT use in language teaching (ICT pedagogy) and their experiences of Continuing Professional Development (CPD). The findings showed that the majority of teachers had held positive attitudes towards ICT use in English teaching and the national reform, their enthusiasm was waning in the light of inadequate support and terms of insufficient ICT facilities and CPD training opportunities. The study further indicated that limited ICT skills and pedagogic expertise were obstacles to the use of ICT in English language teaching.

The relevance of a teacher in the 21st century is determined by the will to develop professionally and appropriately, while teacher development, according to McDougall and Squires (1997) should focus on the following aspects of pre-service and in-service training programs:

- ICT skills with particular applications

- Integration of ICT into existing curricula

- Curricular changes related to the use of ICT including changes in instructional design

- Changes in teacher role in the face of ICT

- Underpinning educational theories

These aspects prepare the teacher to handle the learner-centred processes of education and play the role of facilitator, mentor and coach. This experience is also a learning experience for the teacher, as it will involve discovering new ideas alongside the learners. In a similar vein, Elmore and Burney (1999, as cited in Fullan, 2001, p. 183) describe successful professional development as

• Focusing on concrete classroom applications of general ideas;

• Exposing teachers to actual practice rather than descriptions;

• Providing opportunities for group support and collaboration; and

 • Involving deliberate evaluation and feedback by skilled practitioners.

Harrison (2010) further highlights that:

> *Teacher professional development is seen as the crucial component of educational improvements. However, it is warned that teacher professional development has an impact only if it is focused on specific changes in teacher classroom behaviours and particularly if the professional development is ongoing and aligned with other changes in the educational system (Harrison, 2010, p. 72).*

Over the whole, this requires a very different set of classroom management skills to be developed – including the ability to develop innovative ways of using technology to enhance learning and to encourage technology literacy, knowledge deepening and knowledge creation. While there have been many schemes over the last decade to introduce ICT into schools in Africa, many have failed to live up to their aspirations because they have been top-down and supply led with insufficient attention being paid to the involvement and training of teachers (D. Harrison, 2010).

Furthermore, Olakulehin (2007) identifies four broad approaches through which ICTs could be adopted for teacher training and professional development (see Figure 2.7).

EMERGING	APPLYING	INFUSING	TRANSFORMING

Figure 2.7 Model Depicting a Continuum of Approaches to ICT Application for Teacher Training and Development (Olakulehin, 2007)

The continuum model above (Figure 2.7) demonstrates that teacher skills flow from the emerging to the applying into the infusing and then culminating in the transforming processes of the educative activities which takes place in schools. The Emerging approach is the first stage of ICT skills development in teachers, focusing on the technical functions, components and general uses of ICTs for Education. This approach tends to be theoretical with the practical components involving the personal use of ICT such as the use of word processing to prepare worksheets, locating information on CD-ROMs or on the Internet, or communicating with friends and family via e-mail. The emphasis here is on training of teachers in a range of tools and applications, and increasing teachers' awareness of the opportunities for applying ICT to their teaching in the future. Moving along the model in Figure 2.7 above, transforming teaching through ICTs entails teachers and other support staff in the school system regarding ICT as a natural part of everyday life of the system with the emphasis changing from a teacher-centric to a learner-centric system where the teacher is seen as a 'guide by the side, rather than the sage on the stage', helping students for their learning experiences to construct new learning paradigms out of the various offerings that the school makes available to them. This shift in emphasis in learners' needs also calls for new training needs on the part of the teachers, where they would be imbued with such components of knowledge that prepares them to annex the potentials of ICTs in sourcing and disseminating information to their students (Olakulehin, 2007).

Over a decade ago, Gaible and Burns (2005) produced a major review of the role of ICTs for teacher professional development (TPD) in developing countries, having consulted widely with specialists across the globe. Their review included such areas as computers, the Internet, radio, television, and online distance learning. Even though new ICTs exist today, particularly in the form of mobile devices, the review covered many categories of current relevance, such as needs assessment, available resources, and monitoring and evaluation. In their analysis, each of the ICT approaches was considered in terms of its role in education, various strengths and weaknesses, and cost profile.

In a survey carried out by (Hennessy et al., 2010) in 53 African countries on teacher professional development. The findings of the survey revealed that most of these countries had invested in developing the capacity of teachers to use ICT for teaching and learning through both in-service and pre-service programmes (Farrell & Isaacs, 2007). Most of the programmes emphasise the development of basic ICT skills and occasionally included the application of ICT as a teaching and learning tool for teachers. This is an important outcome since having resources without the expertise on how to use them is a sure path towards wastage of investment. It is also clear that there is a need to expand the professional development programmes as the findings do not portray a picture of large-scale professional development but rather smaller proportions of the teaching force are reached by these initiatives.

Furthermore, Dahri, Vighio, and Dahri (2019) conducted a study to explore the acceptance and use of Web Based Training System (WBTS) for in-service teachers at the Teacher Training Institute in Nawabshah, Pakistan. The main focus of the study is to find out the perception of trainees regarding Web Based Training as Continuous Professional Development of teachers. A questionnaire based on the Unified Theory of Acceptance and Use Technology (UTAUT) framework has been designed to investigate the acceptance and use of WBTS in teachers' training institutes. The findings of this study showed that the in-service teachers were fully motivated regarding the use of a new Web-based training system for their continuous professional development and the improvement of their training without any time and distance constraints. These findings were very vital to support the Government's initiative to further enhance the flexibility and features of any web-based training system towards facilitating teachers' knowledge and skills development. According to Stetson and Bagwell (Batchelor & Olakanmi, 2015) teachers who obtain higher levels of technology training are better prepared to integrate technology in their classroom than the teachers who have no training. On the whole, ICT teacher training is still a challenge both for pre-service and in-service teachers. In this respect, Batman and Ngwako (2017) had ,in a previous study, emphasised that:

> *Equipping pre-service teachers with technology skills and knowledge is now regarded*
> *as a vital element of any teacher-training program so as to capacitate the new teachers*
> *to meet the educational demands of the twenty-first century. Therefore, it is important*
> *to establish whether these teachers do actually apply these skills when they first get to*
> *the field and if not, what could be the hindering factors. (Batman & Ngwako, 2017,*
> *p. 48)*

One area that needs a great deal of attention is related to 'cascade model' of Teacher Professional Development (TPD). This model takes as its primary method the transfer of instructional capabilities from teachers/specialists who have more expertise, to those who have less expertise. A number of the projects highlighted in the Gaible & Burns' (2005) review focused on how to strengthen elements of the aforementioned cascade model through TV, radio, and online TPD. The problem with the typical non-ICT cascade is that each teacher expert can only partially transfer skills to the next level down in the pyramid. ICTs are one way to 'flatten' the pyramid. For instance, according to Ngeze, 2019), in Tanzania, for the past 8 years, teachers have been trained on integrating technology in their teaching and learning in using cascade mode of TPD. Cascade model of TPD involves training of teachers at different levels. Ngeze (2019) explains the running of the cascade model of TPD:

> *At the top level, there are a number of trainers who are selected to meet the training*
> *demands. These are called primary trainers. The first level involves participants*
> *selected from a pool of teachers normally from different schools. These selected*
> *teachers are then trained by the primary trainers based on the content to be covered.*
> *The trained teachers are called 'multipliers' or master trainers – here referred to as*
> *secondary trainers. The secondary trainers then have to go and train other teachers*
> *on the same content they have been trained on (Ngeze,2019).*

However, cascade models of staff development would be more effective if coupled with increased collaborative support from teachers within the same institution (Pelgrum & Law, 2003). As Pelgrum and Law (2003) suggest, considering the potentially diluted effectiveness of this training model, it would be more effective if coupled with collaborative support from teachers within the same communities of practice (e.g. a few teachers are trained first and then they provide training to their colleagues within the same institution) (Hu & McGrath, 2011). Thus, developing a more sustainable model of professional teacher development requires each teacher to not only be confident in their own abilities of integrating technology into the curriculum , but also to provide

pedagogical and technological leadership to their colleagues (Batchelor & Olakanmi, 2015). To this end, Morris et al. (2003) pointed out:

> *When teachers strengthen their content and pedagogical knowledge by participating in professional networks outside of their schools and then share that knowledge in the context of team meetings within their schools, the impact of professional development is doubled(Morris et al., 2003).*

The model in Figure 2.8 demonstrates the combination of training guided by teacher educators and teachers' self-directed development while fully exploiting the versatility of ICT. It also emphasises the value of collaborative learning within teacher communities.
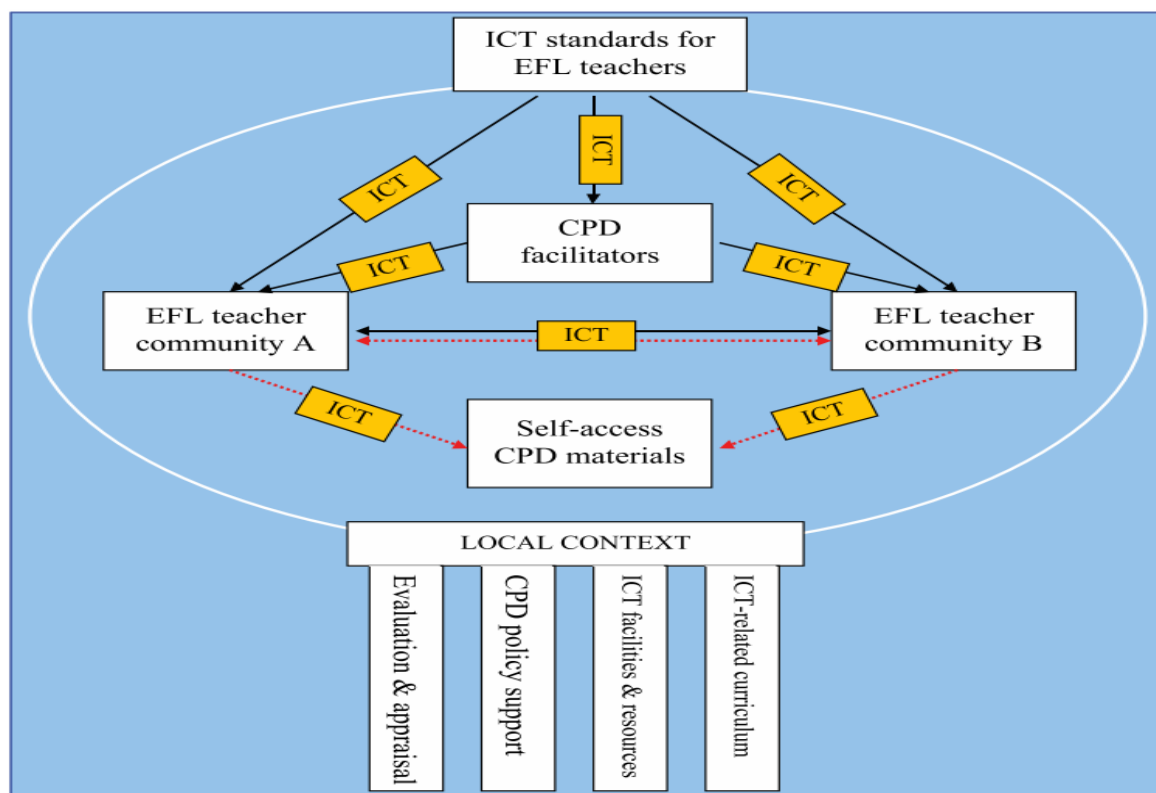
Figure 2.8 An ICT-based Continuing Professional Development (CPD) Model for   EFL Teachers (Z. Hu & McGrath, 2011)

The model above in Figure 2.8 assumes the existence of ICT standards for EFL teachers. At a basic level, these would include basic ICT literacy, such as familiarity with, and confidence in using the Windows operating system, basic word processing, PowerPoint and data software such as Excel and SPSS, software installation, and knowledge of the Internet such as how to use the Internet for resource searching, downloading and uploading files, communication via e-mails, video calls or web

cameras. Higher-level ICT literacy (which can be applied in ELT) would comprise software design, professional PPT design, database set-up, website design, and creation of high-quality online courses. Two types of Continuing Professional Development (CPD) are envisaged: compulsory training (the solid arrows) and self-directed CPD (the dotted arrows). In both CPD forms, ICT serves as a critical medium not only for formal CPD but also for e-networking and exchange within communities of practice. The effectiveness of CPD, however, as the model indicates, is dependent on the provision of favourable conditions, such as an ICT-related curriculum, ICT facilities and resources, CPD policy support and continuous evaluation/appraisal of and feedback on the adequacy of this provision.

Based on findings from Inan and Lowther (2010), it appears that teachers' pedagogical beliefs play an important role in the use of ICT in the classroom (Tondeur et al., 2016) and should be considered as major foci in any approach to teacher professional development (TPD) (Albion, Tondeur, Forkosh-Baruch & Peeraer, 2015). Hence, in exploring the conditions for successful integration of ICT in Education, there is a need for better understanding of the teachers' role, and subsequently, a need to study professional development programs, models and strategies, as a means to improve their impact on teachers' practice. A growing body of research suggests that the involvement of teachers in collaborative design constitutes an effective strategy to develop digital resources in line with their pedagogical beliefs (Kafyulilo & Keengwe, 2014). Synthesising findings from qualitative studies on the relationship between teachers' pedagogical beliefs and their uses of technology, Tondeur et al. (2016) found that teachers' beliefs about 'good' education should be a critical dimension in professional development programs that support teachers learning about the meaningful use of technology in education.

Both self-efficacy and openness to change play a role in a teacher's decision to integrate ICT in the classroom, and this relationship is stronger when teachers receive professional development that addresses their knowledge of ICT integration (Ottenbreit-Leftwich et al., 2018). Thus, knowledge plays a unique role in shaping a teacher's dispositions as well as predicting a teacher's use of ICT technologies. Hence, training in ICT forms an essential part of all teacher training; it covers not only teachers' ICT

competencies but also training on teaching and transferring these competencies to their students(Ananiadou & Claro, 2009).

In many developing countries, teachers are often willing to undertake ICT training. However, many teachers complained that training courses were much too technical and lacked a focus on the pedagogical/didactical aspects of integrating ICT into daily educational practices (Pelgrum & Law, 2003). Hence, it is suggested that efforts should be made to provide opportunities for all interested teachers to learn about ICT-supported didactical approaches that are proven to be relevant and practical. Such training should be organised as university-based efforts so that there will be a broader base of teachers to contribute to its implementation, and more teachers can be involved in developing ways of using the limited IT infrastructure to benefit students to the maximum. Thus, teachers must be given opportunities to regularly update their ICT knowledge and skills as well as to exchange their views on changing curricula and pedagogical practices with the integration of technology into the educational process. The availability of support, both technical and pedagogical, is vital for the successful implementation of ICT.

The use of Information and Communication Technology (ICT) for teaching and learning has become an increasingly common practice in educational settings, especially given that ability to use ICT is a requisite skill in today's digital age (Ananiadou & Claro, 2009). As ICT use by teachers becomes more common, professional development shifts to pedagogical integration, creation of content, and development of shared knowledge and practice (Alayyar et al., 2018). This concept corroborates well with the finding of, a study conducted by the researchers Law and Chow (2008) , that attending pedagogical ICT-related professional development is associated positively with teachers' use of ICT in teaching. They also observed that teachers were generally much more willing to attend pedagogical than technical ICT – related professional development activities. Thus, the willingness and readiness of teachers to integrate ICT will also be a crucial factor (Pelgrum & Law, 2003).

Research suggests that Higher Education Institutions throughout the world must have certain conditions in place if they are to support effective pedagogical use of ICT in their classrooms (Fraillon et al., 2014). These conditions include not only sufficient ICT infrastructure and a positive and collaborative atmosphere where teachers receive

training in how to best use ICT but also a minimum or preferably none of the obstacles that can limit teachers' ability to use ICT in their teaching (Law, Pelgrum & Plomp, 2008). Some other conditions, including access to ICT, available time, and curriculum flexibility, are unlikely to be influenced by TPD. These might be considered to be foundational enabling conditions and are represented as such in the base of the model proposed below in Figure 2.9 to represent teacher professional development for technology-enabled learning environment.
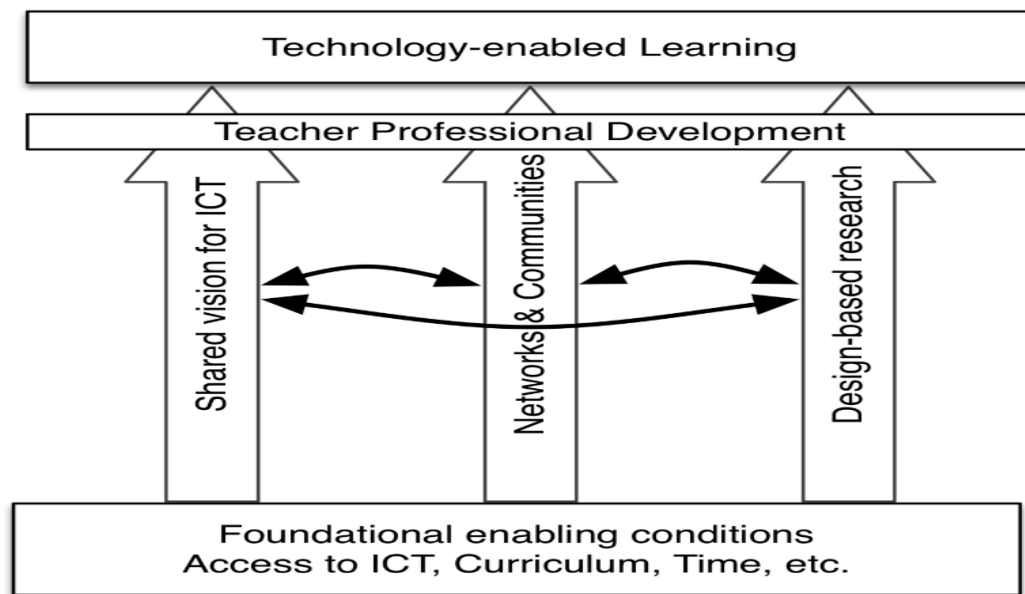
Figure 2.9 TPD for Technology Enabled Learning Environment (Albion et al., 2015)

The importance of ICT in teaching and learning has led many countries worldwide to provide ICT-enhanced training in various forms of professional development. Unfortunately, however, many teachers report inadequate training in their preparation to use technology effectively and in an innovative manner in their teaching practices. Still, there are extensive actions needed around the world in using technology for teacher training, intending to encourage teachers to use technology to improve their teaching (Collis & Jung 2003).

Teachers' professional development is a key factor to successful integration of computers into classroom teaching. Several studies have revealed that whether beginner or experienced, ICT – related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007), influencing teachers' attitudes

towards computers (Mueller, Wood, Willoughby, Ross & Specht, 2008) and assisting teachers reorganise the task of technology and how new technology tools are significant in student learning (Plair, 2008). For instance, in a study of 389 pre-tertiary teachers, Mueller, Wood, Willoughby, Ross & Specht (2008) showed that professional development and the continuing support of good practice are among the greatest determinants of successful ICT integration. In this respect, the provision of ICT-related professional development (ICT-PD) activities is a major means of improving teachers' competence and confidence in using ICT in their teaching(Law et al., 2008). For instance, in a study conducted by Law, Pelgrum, and Plomp (2008), the findings indicated that pedagogical ICT competence was the best positive predictor of teachers' pedagogical adoption of ICT, a finding triangulating well with the observation that the teachers were more willing to attend pedagogical than technical professional-development activities on ICT use. Further, Law and colleagues, therefore, stated that attending at ICT-related professional development significantly and positively correlated with the adoption of ICT.

Teachers' ICT attitudes, ICT skills, and their ICT training have gained currency in regard to effective integration of ICT in today's educational settings. In this respect, improving teachers' ICT skills and competences has become critical since teachers have an important role in effective use of ICT in teaching and learning. In this vein, many countries are providing teachers with ICT training in order to improve their ICT skills and knowledge. These training activities not only foster teachers' ICT knowledge and skills, but also they can improve their beliefs and attitudes towards ICT use in classroom practices. However, Farrell and Isaacs (2007) emphasised that,

> *Teacher training needs to involve much more than the development of computer literacy skills. Teachers need to be able to design and adapt content materials to suit student needs, to search and manage information, and to be aware of the ethics and dangers inherent in the use of ICT technologies. These are some of the ways in which ICTs need to be integrated into continuing teacher professional development and training programmes. (Farrell & Isaacs, 2007,p29)*

The relationship between teachers' computer training and their use of ICT has been well documented in the academic literature. Research supports the idea that the biggest barrier to teachers using technology in their classrooms is the lack of adequate teacher training (Yildirim, 2000). For example, Pelgrum (2001) in his study on the perceptions

of educational practitioners (at the lower Secondary level) regarding obstacles that seriously impede the realization of ICT-related goals of schools argued that large-scale innovations require large-scale teacher training indicating the great importance of in-service training of teachers for successful integration of technology. In a similar vein, it appears from empirical data that it is a lack of training opportunities for teachers, rather than a lack of awareness at the leadership level of schools or a lack of interest from teachers, which stands as a major obstacle (Pelgrum & Law, 2003). Likewise, the teachers' opportunities for professional development encourage the integration of ICT(Elstad, 2016).

Generally speaking, the review of literature in teacher training program shows that lack of professional development for technology use is one of the most serious obstacles to fully integrating technology into the curriculum. Hence, many countries throughout the world have launched teacher training programmes for the use of ICT, but most of the training activities are crash programmes, overemphasising computer literacy while not enabling teachers to integrate technology with pedagogy and facilitate ICT-assisted interactive teaching-learning at classroom level (Majumdar, 2005). Professional development of teachers sits at the heart of any successful technology and education program (Afshari et al., 2009). Therefore, continuous ICT training helps overcome many hindrances and can keep teachers motivated and capable of handling the problems they may encounter. Training will increase the teachers' confidence and competency levels and increase awareness of the benefits of ICT and the skills required for its integration. Improving teachers' technology literacy will positively affect future ICT use in the classroom (Ageel Mutlaq Alswilem, 2019).

Teaching as a profession needs reform in recruitment, selection, status, and reward; redesign of initial teacher education and induction into the profession, continuous professional development, standards and incentives for professional work and, most important of all, changes in the daily working conditions of teachers. Yet, there appears to be little political will to launch sustained reforms in teacher development and in the organisation of the teaching profession more widely. Changing the teaching profession, however, is not an end in itself. Every teacher learning, every day, individually and collectively, is the *sine qua non* of transforming schools for educating all and for

sustaining society (Fullan, 2007). Thus, teachers of today and tomorrow need access to other colleagues in order to learn from them.

As discussed previously, training and development of teachers remain one of the biggest obstacles to meet the growing demand for using ICT in classroom practices. The challenge is not only to train novice or even experienced teachers to use technology but also to prepare teachers to embed ICT use within pedagogy. There is a strong research evidence that significant changes in the pedagogical process (a term that is used interchangeably with the teaching and learning process) are necessary to achieve the goals of successful implantation of ICT. If teachers need to change their behavioural repertoire (for instance, by adjusting their roles or by adopting new didactical approaches), they need to be trained, which means the education institutions leadership (with the backing of university external forces, such as the Ministry of Higher Education) needs to facilitate teachers' participation in professional development courses (be they inside or outside the university walls).

Teachers cannot be trained once and for all. Teachers' professional development, both for an individual and for the profession, has to be a lifelong process. For this purpose, the planning and implementation should be made with a vision to building capacity for both technological and pedagogical expertise, and the major activities shall not be a 'one-shot-training course'(Majumdar, 2005). With changing technology, a teacher's competence needs to be upgraded continuously to sustain the positive outcome of ICT integration. Hence, there has to be a supporting leadership, clear-cut policy guidelines, an environment for increased use of ICT and a network of centres of excellence for teachers' continued development.

In Algeria specifically, different Government bodies collaborate to provide adequate ICT infrastructures to Higher Education Institutions across various initiatives to enable the teachers to use ICT tools and services. However, problems still remain because teachers do not really know what to do with these technologies in the classroom. Hence, in this current research we are arguing that it is not enough just to provide teachers with technological tools but also to provide support in terms of training in how they can integrate the technology into their teaching practices in the classroom in order to develop their expertise in the use of technology of the teaching and learning process.

Conclusion

This chapter has provided some information regarding ICT use in North Africa and MENA countries and then more specifically the adoption of ICT in the Higher Education Institutions of Algeria. The chapter commenced with an overview of the adopted policies for the enhancement of ICT use in education in the developing countries, MENA and Arab World with reviewing of some conducted studies on teachers' use of ICT in Arab countries. This was followed by a discussion of the setting of carrying the present study. Next, a review of ICT initiatives in Algeria with the focus on the adoption of ICT at the level of the Algerian Higher Education Institutions was provided. Then, the organisation of the Algerian Higher Education System with an eye on the reforms and governance was described. Finally, the chapter concluded with a discussion of issues related to the integration of ICT in teaching and learning process starting with an analysis of the reasons behind teachers' pedagogical uses of ICT and the requirements that might facilitate the use of ICT in their classroom practices.

The overall goal of the educational reforms in many countries throughout the world is to develop an effective ICT-based learning environment. It is the opinion held by the us in the current research. Hence, in order to achieve this goal, investigating the factors influencing teachers' acceptance and use of ICT into classroom practices is of utmost importance in several ways. Most importantly, investigating the determinants of teachers' use of ICT can be useful in identifying the barriers to effective implementation of ICT in education and to determine if interventions are required. In the next chapter, the methodology and methods employed to research the factors that influence teachers' acceptance and use of ICT in teaching practices will be detailed.

Section Two: Empirical Research

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

Introduction

The purpose of this mixed methods study was to better understand the factors that influence University teachers' acceptance and use of ICT in classroom teaching practices by combining both quantitative and qualitative data. In the current study, the actual use of ICT was explored using quantitative online questionnaires and qualitative semi-structured interviews with Algerian Higher Education teachers at the Department of English, Hassiba Benbouali University of Chlef.

On the basis of what has been discussed in the preceding Chapters 1 and 2, the literature review showed several gaps regarding teachers' usage of Information and Communication Technology (ICT) that could be filled by the current research, notably the factors related to the acceptance and use of educational technologies by University EFLteachers in the Algerian Higher Education Institutions (AHEIs) in general, and more specifically at the University of Chlef.The gaps include few investigative studies on intention to use ICT and actual ICT usage and few studies making use of mixed method approaches. The current study seems relevant because it attempts to adopt a mixed method research design to identify the factors that influence ICT usage by teachers in Higher Education Institutions in Algeria, thus bridging this observed gap in the ICT literature. In order to address this knowledge gap, it is essential to carefully plan and choose the appropriate methods of data collection in order to answer the research questions and hypotheses. This plan is in fact the methodology.

The term '*methodology*' is defined by Packer and Goicoechea (2000) as –'the strategy, plan of action, process, or design that lies behind the choice and application of certain procedures and links the choice and use of methods to the desired outcomes'. It is a plan for how research will proceed – how researcher will combine the different elements of research (philosophical beliefs, the selection of appropriate methods, theories, and ethics) into a plan that details how the specific research project will be carried out (Leavy, 2017). Hence, methodological considerations refer to the research design and the process of addressing a given research problem – including the approach to literature review, the nature of the data to be collected, analysed and interpreted (Imenda, 2014). Inevitably, these issues also touch on the broader discussion of research

paradigms, given that the types of research problems pursued, methods of investigation employed, the types of data collected, analysed and interpreted – as well as the underlying epistemological assumptions under the dominance of the new emerging research paradigm (that is, the combination of qualitative and quantitative strands in a single mixed methods study).

By using an exploratory sequential design, themes of psychological factors (such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes toward Using Technology) and socio-demographic factors (such as age, gender and teaching experience) are generated. Then, the responses concerning the impact of psychological factors are used to generate a semi-structured interview that allows us to measure the impact that these psychological factors have on teachers' use of ICT in the EFL classroom. To make sense of this data, the revised Unified Theory of Acceptance and Use of Technology (UTAUT) model is used as a guiding theoretical framework for this study (as detailed in 'Chapter One'). Thus, this Chapter presents the processes followed in order to select the appropriate methods of data collection and analysis. The objectives and research questions will also be briefly discussed in addition to the theoretical framework of the study. Furthermore, the paradigmatic and philosophical assumptions of the study are addressed, with particular respect to its ontological and epistemological underpinnings in relation to the question of factors that influence Foreign Language teachers' usage of ICT in their institutions, and how these factors influence teachers' use of ICT in their teaching practices.

The main purpose of this study is to use the modified Unified Theory of Acceptance and Usage of Technology (UTAUT) to investigate the *psychological* and *socio-demographic* factors that influence EFL teachers' Behavioural Intention and Actual Use of ICT in Algerian Higher Education Institutions, more specifically at the University of Chlef.

To achieve the purpose of this study, the following objectives have been identified.

- To investigate the factors that influence EFL teachers' Behavioural Intention and Actual Use of ICT in the Algerian Higher Education through the extended Unified Theory of Acceptance and Use of Technology

- To identify the effect of socio-demographic characteristics of teachers on actual use of ICT.
- To develop a theoretical framework for ICT acceptance in the context of Higher Education Institutions (HEIs) in Algeria.

A review of the literature suggested the need to fill the gap related to the factors that influence informants' actual usage of ICT in their teaching practices (see section 1.6). Therefore, the level of use of ICT by teachers will be based on the influence of these factors. In order to achieve its objectives, the study sought to answer the following research questions:

RQ 1: What are the psychological factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education Institutions (AHEIs) specifically at the University of Chlef? This question thus devolves into a number of subsidiary questions that need to be investigated through the primary research, as follows:

• *To what extent (if any) do Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) influence EFL teachers' Attitudes Toward Using Technology (ATUT) in the Algerian Higher Education Institutions (HEIs)*?

• *To what extent (if any) do Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Attitudes Toward Using Technology (ATUT) influence EFL teachers' behavioural intention to use ICT in the Algerian Higher Education Institutions (HEIs)*?

• *To what extent (if any) is Behavioural Intention (BI) a predictor of use behaviour (UB) of ICT at HEIs?*

RQ 2: How do teachers' socio-demographic variables (age, gender, technology and teaching experience) moderate the effects of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes Toward Using Technology on teachers' intention to use ICT?

RQ 3: How can the Unified Theory of Acceptance and Use of Technology (UTAUT) model be used to better understand what Algerian Higher Education teachers perceive they need to effectively adopt ICT in their teaching practices?

Studies that establish causal relationships between variables may be termed explanatory research (Saunders, Lewis & Thornhill, 2016, 2019). According to Yin (2014), *how* and *why* questions are preferred when the focus is on real life phenomena and – the investigator has little control over events. Likewise, Saunders, Lewis, and Thornhill (2019) note that research questions that seek explanatory answers are likely to begin with, or include, '*Why*' or '*How*'. However, in this research, the above questions are *what* and *how* questions. Yin argues that *what* questions can be used in exploratory research while *how* and *why* questions are more explanatory and likely to lead to the use of a case study as the preferred research method. The three research questions formulated by this study involve *how* and *why* because they require the breadth and depth and cannot be answered simply by listing the psychological and socio-demographic factors. Rather, the answer needs to encompass how these factors affect and why they affect ICT usage. Therefore, the emphasis in explanatory research is to study a situation or a problem in order to explain the relationships between the latent variables.

It seems to be obvious by now that a successful mixed methods study (MM) must start with a solid MM research question or objective that clearly justifies the need for both QUAN and QUAL components to be used and integrated. Answering questions with interconnected QUAL and QUAN features (e.g., *what* and *how* or *what* and *why*) should lead to conclusions or explanations which in turn should lead to correlated QUAN and QUAL inferences (Teddlie & Tashakkori, 2009). As we suggested before, the nature and form of research questions are usually different in sequential and parallel MM studies. In sequential studies, the questions of a second (or later) strand usually (but not always) emerge as a result of the findings from the first strand.

This Chapter describes the methodology that was used to study the factors that influence EFL teachers' acceptance and use of ICT in their teaching practices from the Department of English at Hassiba Benbouali University of Chlef. The chapter includes the following sections: philosophical assumptions, research design, stages of the

research, population and sampling, research variables and hypotheses, piloting of research tools, data collection methods, data analysis procedures ,validity and reliability of the chosen research tools as well as ethical considerations. To begin, it is important to discuss the underlying *philosophical assumptions* that have guided this mixed methods research.

3.1. Philosophical Assumptions

Philosophical stances, what some scholars refer to as *paradigms*, have been a topic of much debate in the mixed methods research (MMR) literature (Meixner & Hathcoat, 2019). That is whether there is a possibility of 'mixing' methods that draw from very different philosophical assumptions about the nature of reality (are there multiple realities constructed by individuals, or is there one reality that can be measured?)(Merriam & Grenier, 2019). As stated by Mertens (2012), the mixed methods community is awash in discussions about philosophical frameworks or paradigms that provide guidance for mixed methods approaches. Hence, better understanding of mixed methods research requires a focus on the philosophical issues such as what knowledge warrants our attention, how knowledge is learned, the nature of reality and values, and also the historical and sociopolitical perspectives that individuals bring to research (Creswell & Tashakkori, 2007).

According to Creswell & Clark (2018),all research has a philosophical foundation, and inquirers should be aware of assumptions they make about gaining knowledge during their studies. Hence, researchers must also consider the philosophical assumptions that provide a foundation for using mixed methods (Creswell & Clark, 2018).The philosophical assumptions that surround MMR consist of a basic set of key beliefs and assumptions that guide the inquiries (Creswell & Creswell, 2018). The researchers "bring to their investigation a worldview formed of beliefs and assumptions about knowledge that shapes their study (Creswell, 2011, p. 39). Thus, the articulation of philosophical assumptions in this sequentiall mixed methods study involves acknowledging the worldview that is providing a foundation for the study, describing the elements of the worldview, and relating these elements to specific procedures in the mixed methods project.

According to Creswell and Creswell (2018), the approach to research involves philosophical assumptions as well as distinct methods or procedures. The broad research approach for the conduct of research involves the intersection of philosophy, research designs, and specific methods. A framework that is used to explain the interaction of these three components is diagrammatically represented in Figure 3.1. To reiterate, in planning a study, researchers need to think through the *philosophical worldview assumptions* that they bring to the study, the *research design* that is related to this worldview, and the *specific methods* or *procedures of research* that translate the approach into practice.

Figure 3.1 A Framework for Research—The Interconnection of Worldviews, Design, and Research Methods (Creswell & Creswell, 2018, p. 43)

As illustrated in Figure 3.1 , there are four major elements in designing a study. At the broadest level are *the issues of philosophical assumptions* (or worldviews), such as the epistemology behind the study or the assumptions regarding how researchers gain knowledge about what they know. These philosophical assumptions, in turn, inform the use of a *theoretical stance* the researcher might use. This stance then informs *the methodology used,* which is a strategy, a plan of action, or a research design. Finally, the methodology incorporates *the methods*, which are techniques or procedures used to gather, analyse, and interpret the data'. Mixed methods research is therefore based on philosophical assumptions that guide the collection and analysis of data and the mixing of quantitative and qualitative collection techniques and analysis procedures (Molina-Azorin et al. 2017). Other terms that are often used synonymously with the description of philosophical assumptions or perspectives are *worldviews* and *paradigms* (Creswell & Clark, 2018; Meixner & Hathcoat, 2019).

There are four worldviews that are widely discussed in the literature: *post-positivism, constructivism, transformative,* and *pragmatism* (see Creswell & Creswell, 2018 for an in-depth analysis). Each worldview is laden with assumptions in terms of what is deemed real in the world (*ontology*), how we gain knowledge of what we know (*epistemology*), the role of values in research (*axiology*), the procedures used in the research study to understand the question (*methodology*), and the language used in research (*rhetoric*) (see Creswell & Clark, 2018; Meixner & Hathcoat, 2019).

Pragmatism is generally regarded as an attractive philosophical partner of the mixed methods approach (Denscombe, 2010; Mitchell, 2018). It provides a set of assumptions about knowledge and enquiry that (1) underpins the mixed methods approach; and (2) distinguishes the approach from purely quantitative approaches that are based on a philosophy of *positivism* and purely qualitative approaches that are based on a philosophy of *interpretivism* (Denscombe, 2008).Hence,MMR draws from the characteristics of both quantitative research (*positivism*) and qualitative research (*interpretivism*).Thus, we consider one philosophical position in the context of the current research that is often associated with mixed methods designs: *pragmatism.*

As an underlying philosophy supported by a large number of mixed methods scholars, the current study is based on the philosophical assumption of *pragmatism.* *Pragmatism* focuses on the consequences of research—the action, situations, and consequences of inquiry—rather than the antecedent conditions. That means,*pragmatism* as a worldview or philosophy arises out of actions, situations, and consequences rather than antecedent conditions (as in post-positivism). There is a concern with applications – what works – and solutions to problems. Instead of focusing on methods, researchers emphasise the research problem and use all approaches available to understand it (Creswell & Creswell, 2018). *Pragmatism* is not devoted to any one philosophy or reality paradigm. The researcher is free to select the research methods, techniques, and procedures that best suit their needs and objectives (Creswell, 2013). As explained by Creswell (2011), *pragmatism* "is often associated with mixed methods research. The emphasis is on the outcomes of research, on the primary value of the question asked rather than the methods" (p. 41). Therefore, the MMR researcher concentrates on practise and 'what works.' Hence, *pragmatism* rejects the either/or

choices associated with the *paradigm* wars[5], advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results' (Teddlie & Tashakkori, 2009, p. 14). In this worldview, the emphasis is on the outcomes of research (Leavy, 2017), on the primary importance of the question asked rather than the methods, and the use of multiple data collection methods to illuminate the problems under investigation. As a result, it is pluralistic and focused on 'what works' and real-world practice (Creswell & Clark, 2018).

Pragmatists assert that there are many different ways of interpreting the world and that different methods are often appropriate within one research study. This means that pragmatists choose methods that enable credible , reliable and relevant data to be collected to address the research problem (Saunders, Lewis & Thornhill, 2009, 2012; Saunders et al., 2016, 2019). For pragmatists, the nature of the research question, the research context and likely research consequences are driving forces determining the most appropriate methodological choice (Nastasi et al. 2010).In the same vein, leaders in the field of mixed methods research, Abbas Tashakkori and Charles Teddlie (1989, as cited in Leavy, 2017, p. 128), state that *pragmatism* encourages the use of both qualitative and quantitative methods, places the research question(s) at the heart of the investigation, and ties all methodological decisions to the research question (s). Hence, in the context of the current study, the pragmatic worldview is upheld as deductive and inductive thinking are combined by mixing qualitative and quantitative data. Specifically, multiple methods of data collection are used to best answer the research questions and test hypotheses. Thus, a pragmatic approach is based on abduction reasoning that swings back and forth between induction and deduction, whereas a quantitative approach is primarily based on deduction and a qualitative approach is focused purely on induction (Venkatesh et al., 2013).Thus, as explained by Munoz-Najar Galvez, Heiberger and McFarland (2020) , *pragmatism* supports the use of different research methods and that a continuous cycle of inductive, deductive and when

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[5] Historically, '*paradigm wars*' refers to the period in the past when paradigmatic stances were seen to be incommensurable (Lisa M. Given, 2017). This term was coined by N. L. Gage 'to characterize the adversarial character of the methodological debates that were occurring during the final quarter of the 20th century'

appropriate, abductive reasoning, produces useful knowledge and serves as a rationale for rigorous research.

The theoretical assumptions behind a mixed methods study need to be identified and stated in mixed methods projects to provide a basis for combining quantitative and qualitative approaches (Creswell & Clark, 2018). As the current study adopted a theoretical framework (section 1.4 page 58) that aimed to examine the factors that influence EFL teachers' ICT accaptance and usage in Tertiary Institutes in Algeria, this investigation of the social phenomena needed to carefully consider the Algerian Higher Education context, in line with the goals of mixed methods research. According to Johnson and Turner (2003) – mixed methods research can leverage the complementary strengths and nonoverlapping weaknesses of qualitative and quantitative methods, and offer greater insights on a phenomenon that each of these methods individually cannot offer (Venkatesh et al., 2013). The overall goal of mixed methods research, of combining qualitative and quantitative research components, is to expand and strengthen a study's conclusions and, therefore, contribute to the published literature (Schoonenboom & Johnson, 2017). The epistemology underpinning mixed methods as the approach to research enquiry is a pragmatic assumption which recognises the fact that the world is not exclusively qualitative or quantitative but rather, a mixed world (Teddlie and Tashakkori 2009).

Specifically, the quantitative survey data derived from the first phase of data collection is used to inform the construction of the qualitative interview instrument in the second phase of the study. In doing so, the semi-structured interview will address constructs that will more accurately tell the story behind the use of ICT in teaching practices by EFL teachers at the University of Chlef. In sum, *pragmatism* presents a practical and applied research philosophy (Venkatesh et al., 2013) because it enables the researcher solve practical problems regardless of whether the methodology is quantitative or qualitative.Hence, the current study used a mixed methods approach under the umbrella of *pragmatic philosophical assumptions*. In this regard, the objective of a *pragmatic approach* is to explore the research problem and emphasis on the study's outcomes. Hence, this *pragmatic approach* is *best* suited to this exploratory study, as mixed methods will allow us to gather data that will build a strong theoretical

framework. Therefore, a framework is needed for thinking about how to position philosophy within a mixed methods study design. A more detailed explanation of the selection of this particular research design is discussed in the section that follows.

3.2. Research Design and Rationale

To answer the study research questions, we used a mixed methods approach which is a procedure for collecting, analysing and mixing or integrating both quantitative and qualitative data at some stage of the research process within a single study or series of studies (Creswell & Clark, 2018; Kajamaa, Mattick & Croix, 2020), resulting in a comprehensive understanding of the phenomenon under investigation (Leavy, 2017, p. 151). The core argument for mixing both forms of data provides a better understanding of a research problem than either quantitative or qualitative data alone (Greene, Benjamin & Goodyear, 2001; Creswell & Clark, 2018). This is based on the principle that integration provides a more complete and synergistic utilisation of data, versus discrete quantitative and qualitative data collection and analysis (McBride, MacMillan, George & Steiner, 2019) to capture the trends and details of situations, such as the complex issue of the factors that contribute to teachers' use of ICT in their teaching practices. In this regard, quantitative and qualitative methods complement each other and create a fuller picture of the study problem when they are used together.

We adopted a sequential explanatory mixed methods design in the current study consisting of two distinct phases: starting with a quantitative phase, the results from which we drove the development of a heavily emphasised second qualitative phase. In this design, the quantitative, numeric, data is collected and analysed first, while the qualitative, text, data is collected and analysed second in sequence, and helps explain, or elaborate on the quantitative results obtained in the first phase. The second (qualitative) phase builds on the first (quantitative) phase, and the two phases are connected in the intermediate stage (instrument development) of the study.

In this study, the quantitative data helped to identify a potential predictive power of selected exogenous and endogenous latent variables on the EFL teachers' acceptance and use of ICT and purposefully selected the informants for the second phase. Then, a qualitative case study approach was used to explain why certain latent variables, tested

in the first phase, were significant predictors of teachers' actual use of ICT in their teaching practices. Therefore, the quantitative data and results offered a general picture of the research problem, while the qualitative data and its analysis clarified and explained those statistical results by exploring the informants' views and lived experiences regarding their ICT usage in teaching practices in more depth.

The qualitative approach was given priority in the current research study because it concentrated on in-depth explanations of the quantitative results and entailed considerable data collecting from different sources and two-level case analysis. In the current study, the quantitative and qualitative phases were connected when selecting six informants for follow-up qualitative case studies and developing the interview protocol [6] based on the results from the statistical tests from the first phase. The results of the quantitative and qualitative phases were integrated during the discussion of the outcomes of the entire study

As previously stated, both purely quantitative and qualitative approaches have limitations. However, a mixed-methods design helps to mitigate these constraints while also using the strengths of each approach (Creswell, 2015a). As a result, the goal of this study is to combine both the quantitative data from the survey and the qualitative data from the interview inquiry (see Morgan, 1998 for an in-depth analysis for the motives of combining quantitative and qualitative methods). Recently, a growing number of researchers have been more willing to use mixed approach for the collection and analysis of data, as they consider that collecting both qualitative and quantitative data will provide the best understanding of the research problem (e.g., Ivankova & Stick, 2007; Zalah, 2018). Besides, researchers who use the mixed approach tend to create an aim for their 'mixing' –a justification for mixing qualitative and quantitative data in a particular study (Lawrence, 2002). This study aims to integrate the two types of data by using an explanatory sequential mixed methods research design, as more fully described below in Section 3.4.2.

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[6] Interview protocol is a form used in qualitative research to collect qualitative data. On this form are questions to be asked during an interview and space for recording information gathered during the interview. This protocol also provides space to record essential data about the time, day, and location of the interview (Creswell & Clark, 2018).

The questionnaire survey highlights which areas of the study necessitate further exploration of the experiences and attitudes of Algerian EFL teachers at the University of Chlef toward the use of Information and Communication Technology (ICT). Although the questionnaire survey asks questions related to all of the constructs used in the theoretical research model, as well as acquiring general information about the informants and their experience with using Educational Technology, these answers will only address the '*what*'. To find out the '*why*' more in-depth questioning is needed; a qualitative approach is adopted to accomplish this. Other advantages of this approach are that the researcher can check the informants' understanding of the questions and interviewees have the opportunity to raise issues that the researcher may not have considered.

Additionally, there were three main rationales for mixing methods in the research of the factors that influence teachers' acceptance and use of ICT. First, using both qualitative and quantitative approaches to examine the determinants of teachers' ICT use offers more confidence in the validity and reliability of the study findings than using only one approach, and can also support the generalisability of the findings. Mixed methods approaches can minimise errors that may arise from a single approach and confirms data accuracy (Tashakkori & Teddlie, 2003). Consequently, adopting both qualitative and quantitative approaches provided what Collins, Onwuegbuzie & Jiao (2007) call '*significance enhancement*' (p. 288). *Significance enhancement* involves using qualitative and quantitative methods to maximise the interpretations and understanding of the phenomenon being addressed. Specifically, in the current study we used quantitative and qualitative approaches to gather richer information than would have been gathered using only one type of approach, thus, enhancing the significance of the findings. That is, the qualitative data were used to enhance the quantitative data.

The second rationale for adopting mixed methods in this research study was complementarity, in which different approaches were used to examine different aspects of a phenomenon producing an enriched, elaborated understanding of that phenomenon. The quantitative questionnaire was used to examine the factors that influence EFL teachers' acceptance and use of ICT from the Department of English at Hassiba Benbouali University of Chlef. Additionally, data from the quantitative method were

used to examine the relationships between the dependent variable (teachers' actual use of ICT) and some of the independent variables, for example, teachers' *Attitudes Towards Using Technology (ATUT)* and *Behavioural Intention (BI)* constructs. In addition, the actual use of ICT was examined using qualitative semi-structured interviews with Algerian University teachers to explore '*what*' and '*how*' factors affect teachers' ICT usage in order to provide an in-depth understanding of the determinants of EFL teachers' use of ICT into their classroom practices. Also, this qualitative element was employed to ensure the trustworthiness of the quantitative findings. In this regard, the use of mixed methods may allow meanings and findings to be elaborated, enhanced, clarified, confirmed, illustrated or linked from one method with the meanings and findings from another (Greene, Caracelli & Graham, 2008; Saunders et al., 2019).

The final and third rational to consider incorporating a mixed methods design in the current research is *triangulation*, or, more specifically, *between-method triangulation* (Denzin, 2009), in the context of methods alone – refers to the use of more than one method while studying the same research question in order to 'examine the same dimension of a research problem'. For this type of triangulation, the purpose was not to achieve identical findings because 'the perspectives and theoretical assumptions behind the methods differ' (Williamson, 2005). Instead, this type of triangulation was employed as a strategy for 'deepening the analysis in studies' (Dinh, 2015). In line with the principles of triangulation, the mixed methods approach provides the researcher with the opportunity to check the findings from one method against the findings from a different method (Denscombe, 2010). That is, triangulation using multiple methods for collecting data can help produce more comprehensive findings and compensate for any disadvantages associated with one particular method (Patton,2015 as cited in Hanson, Ju & Tong, 2019). In the words of Greene, Caracelli, and Graham (2008), this use of the mixed methods approach 'seeks convergence, corroboration, correspondence of results from the different methods'. In this respect, we are looking for a corroboration of the data collected by all methods in a study to enhance the credibility of the research findings. *Triangulation* ultimately fortifies and enriches a study's conclusions, making them more acceptable to advocates of both qualitative and quantitative methods. Hence, the concept of *triangulation* is a key construct in mixed methods research that shows

where the philosophical assumptions of qualitative and quantitative research methods meet (Creamer, 2018). In consequence, the use of a mixed methods approach calls for a clear appreciation of '*triangulation*' and makes good use of its potential (Denscombe, 2010). Thus, both *complementarity* and *triangulation* are useful 'for cross-validation when multiple methods produce comparable data' (Yauch & Steudel, 2003, p. 466).Figure 3.2 illustrates the design of this research study. It shows the number of informants in each phase as well as the data collection and analysis techniques used to respond to the research questions.

Process	Procedure	Product	Timeline
Quantitative Data Collection	Cross-sectional web-based survey (N=45) **Data Collection Variables**	Numeric data Database with variables/Constructs	June
Quantitative Data Analysis	• Data screening • Regression analysis • Frequencies • SPSS quan. software v.26	• Statistical results in tables • Significance results, effect sizes, confidence intervals	July
Purposefully Sampling; Interview	• Purposefully Sampling 6 informants from survey pool (N=6) • Developing interview questions	• Cases (N=6) • Interview protocol	August
QUALITATIVE Data Collection	• Individual in-depth semi-structured interviews with 6 informants • Email follow-up interviews • Data collection • Central phenomena	• Text database transcribed for easy coding (interview transcripts)	Sept
QUALITATIVE Data Analysis	• Coding and thematic analysis using MAXQDA2020 qualitative software • Within-case and across-case theme development • Cross-thematic analysis	• Visual model of multiple case analysis • List of quotes, codes and themes • Similar and different themes and categories • Cross-thematic matrix	Oct
Integration of the Quantitative and Qualitative	• Interpretation and explanation of the quantitative and qualitative results	• Discussion • Implications • Future research	Nov

Phase I — Academic Year 2020-2021

Phase II — Academic Year 2021-2022

Figure 3.2 Visual Model for Mixed Methods Sequential Explanatory Design

Procedures

Put it in a nutshell, the rationale of mixing both types of data within one study is grounded in the fact that neither quantitative nor qualitative methods are sufficient by themselves to capture the trends and details of situations (Creswell & Clark, 2018), such as the complex issue of the factors contributing to teachers' acceptance and use of ICT in their classroom teaching practices. When used in combination, quantitative and qualitative methods complement each other and provide a more complete picture of the research problem, taking advantage of the strengths of each (Ivankova et al., 2006). Thus, all of the aforementioned rationales provide strong arguments for us to consider the adoption of a mixed methods approach in the current study.

In studies where existing information on the topic is scant, such as the current research, the use of mixed methods approach 'seems to be a powerful mechanism to interject context into a research inquiry' (Venkatesh et al., 2013. p. 36). In a non-Western context, this approach is more likely to 'unearth factors that are not typically common in a developed country' (Venkatesh et al., 2013. p. 36). As also evidenced by the aforementioned rationales, the use of a mixed methods research design is beneficial to this study. Hence, this study illustrates the power and possibilities inherent in mixed methods research. We unearthed the convergence and corroboration of the data from surveys and interviews through *triangulation* as well as the *complementarity* of the qualitative and quantitative data which might give us a deeper understanding of the factors that influence teachers' acceptance and use of ICT in the Algerian Higher Education Institutions. Therefore, the use of theory and theoretical propositions (*assumptions*) in doing mixed methods studies is an immense aid in defining the appropriate research design and data to be collected. The same theoretical orientation will also become the main vehicle for generalising the findings from the mixed methods study. According to Bryman and Cramer (2001, 2011) and Khan & Qudrat-ullah (2021),a research design provides the basic structure within which an investigation takes place to obtain the answers to the research question. The next section deals with stages of research in relation to the use of mixed methodology approach.

3.3. Stages of the Mixed Methods Research

In the current study, the problem has been identified through a series of research questions and hypotheses that are to be addressed using a mixed-methods approach which allows us to move from problem identification to conclusions. Therefore, the research consists of a preliminary phase where the research is designed, followed by Phase One which consists of an online survey of Algerian University EFL teachers at University of Chlef and Phase 2 where a sample of those teachers are interviewed face to face. The form of this explanatory sequential mixed methods approach is explored below.

3.3.1. The Preliminary Phase

As already mentioned, the preliminary phase involved reviewing the literature; referring to our own experiences working in the Algerian Higher Education sector and a series of informal discussions that were conducted with EFL teachers at Hassiba Benbouali University of Chlef. Such preliminary activity is important, even though it is time consuming to conduct the research because it is a way of discovering how the target population actually perceives and talks about the subject under investigation. In this way, researcher bias can be mitigated.

Given the myriad of research decisions that are made in the construction and analysis of any study, the acknowledgment of the potential for researcher bias is an important contribution to social science research (Wheeldon & Ahlberg, 2019). Bias can occur at any phase of research, including study design or data collection, as well as in the process of data analysis and publication (Wilson, 2019). In this way, researcher bias can be minimised (Zalah, 2018;Hanson, Ju & Tong, 2019) to ensure the findings capture informants' perspectives. A criterion for rigour in qualitative research involves the demonstration of reflective thought (i.e. *reflexivity*) to minimise researcher bias and ensure data are collected in ways that privilege participant's experiences (Liamputtong, 2019). Hence, *reflexivity* requires the researcher to acknowledge and address the influence they may have on the data collection and study results (Hanson et al., 2019).

In this mixed methods research, two research tools were used: an online survey questionnaire (Quantitative Phase 1) and individual face-to-face semi-structured

interviews (Qualitative Phase 2). We distributed and collected completed online questionnaires via the use of Google Form Application. Potential informants received an invitation email to participate in the study, including information about their participation being voluntary and all responses being confidential and anonymous. Then, qualitative data collection commenced right after the analysis of the survey results. Thus, a purposeful sample of six teachers was selected from informants who expressed interest in participating in follow-up interviews. They were interviewed individually to ensure an in-depth exploration and explanation about the similarities and differences between the teachers' responses. All interviews lasted for about 10–25 minutes. The interviews were audio tape recorded and later transcribed.

The teachers consulted in this phase were all from the same University, taught different modules and had various lengths of service. The six teachers interviewed were all known to the researcher, which meant that they agreed to be interviewed after obtaining their consent; this was done face-to-face. Knowing the teachers made it easy to approach them and ask if they would be willing to have a conversation about their experience and attitudes towards Information Technologies. The interviews were informal for all the six EFL teachers, and we took also notes.

Using the interview notes, we identified a number of recurring themes, as follows: Training Issues (not practical), Facilitating Conditions (not enough digital resources and technical support). Most of the informants perceived that there was encouragement from the surrounding environments (especially from colleagues, friends) to use the technologies. Some said they had to provide their own equipment, such as computers or mobile phones. This information, along with the results obtained from reviewing the few studies conducted on technology acceptance in the Arab educational context in general and in Algeria in particular, gave rise to revisiting the UTAUT model and proposing additional elements that may better explain the acceptance and use of digital educational technologies in this context. Figure 3.3 shows the proposed UTAUT model for the current study.
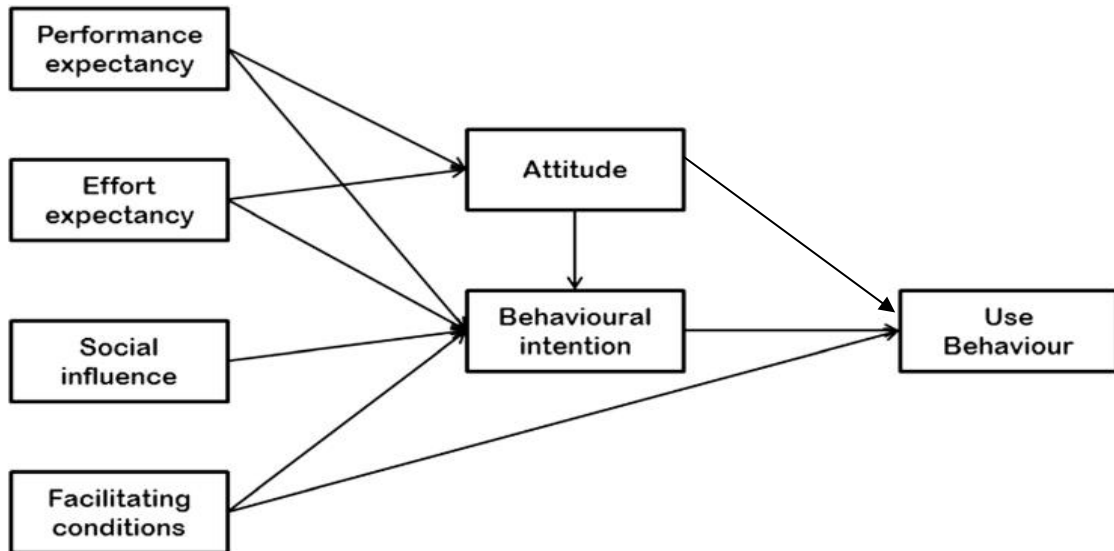
Figure 3.3 Proposed UTAUT Model Revised for the Purposes of this Study

Some of the concerns raised by the interviewed teachers were linked to elements already present in the UTAUT model, such as Facilitating Conditions; others, such as teachers' workload, led to the inclusion of the barriers as an element of the revised UTAUT model that is proposed as a basis for the empirical investigation.According to Saunders et al. (2019), the research process is a sequence of stages that one must go through in order to answer his or her research question and complete the research project. In general, these stages include developing a research topic, conducting a literature review, designing the study, collecting data, analysing the data, and finally writing up the report.

3.3.2. The Explanatory Sequential Mixed Methods Design

Mixed methods research (MMR) can be classified by sequence, type of data collection, and purpose which results in distinct approaches to mixed-methods research design. The design that is selected will determine how the datasets generated by the different methods are to be integrated (Creswell, 2015a). As explained earlier in this chapter, MMR was developed as a problem-centred approach to research design. If Information System researchers plan to conduct a study for which a strong theoretical foundation already exists but the context of the research is novel or previous findings were fragmented and/or inconclusive, they may consider conducting a quantitative study first, followed by a qualitative study to provide additional insights based on context-

specific findings or reasons for fragmented and/or inconclusive previous findings (Venkatesh et al., 2013). Hence, the explanatory sequential design is probably the most straightforward of the mixed methods designs (Creswell & Clark, 2018) since only one type of data is collected and analysed at a time.

The current research adopts the explanatory sequential mixed methods (also referred to as the *explanatory design*) which is a form of mixed methods design in which we first conduct quantitative research through the submission of an online survey questionnaire, next we analyse the results and then build on the results to explain them in more detail with qualitative research by adopting a qualitative data collection component through the conduct of face-to-face semi-structured interviews with selected informants from the quantitative component. In the same vein, the results from the first phase are used to structure the second phase in terms of who should be recruited to participate and what questions they should be asked in the semi-structured interviews. In this respect, these interviews are intended to better explain the quantitative data. The design of the present study is considered explanatory because the initial quantitative data results are explained further with the qualitative data. It is considered sequential because the initial quantitative phase is followed by the qualitative phase (see Figure 3.4). In this approach, the results of Phase Two lend depth and further explanation to the data collected in Phase One (Creswell & Creswell, 2018).

Theoretical Framework

Unified Theory of Acceptance
and Use of Technology (UTAUT)

Quantitative Data
Collection and Analysis

Quantitative
Results

Determine
Quantitative Results
to Explain

Phase 1

Integration

Interpret How
Qualitative Results
Help Explain
Quantitative
Results

Qualitative
Results

Qualitative Data
Collection and Analysis
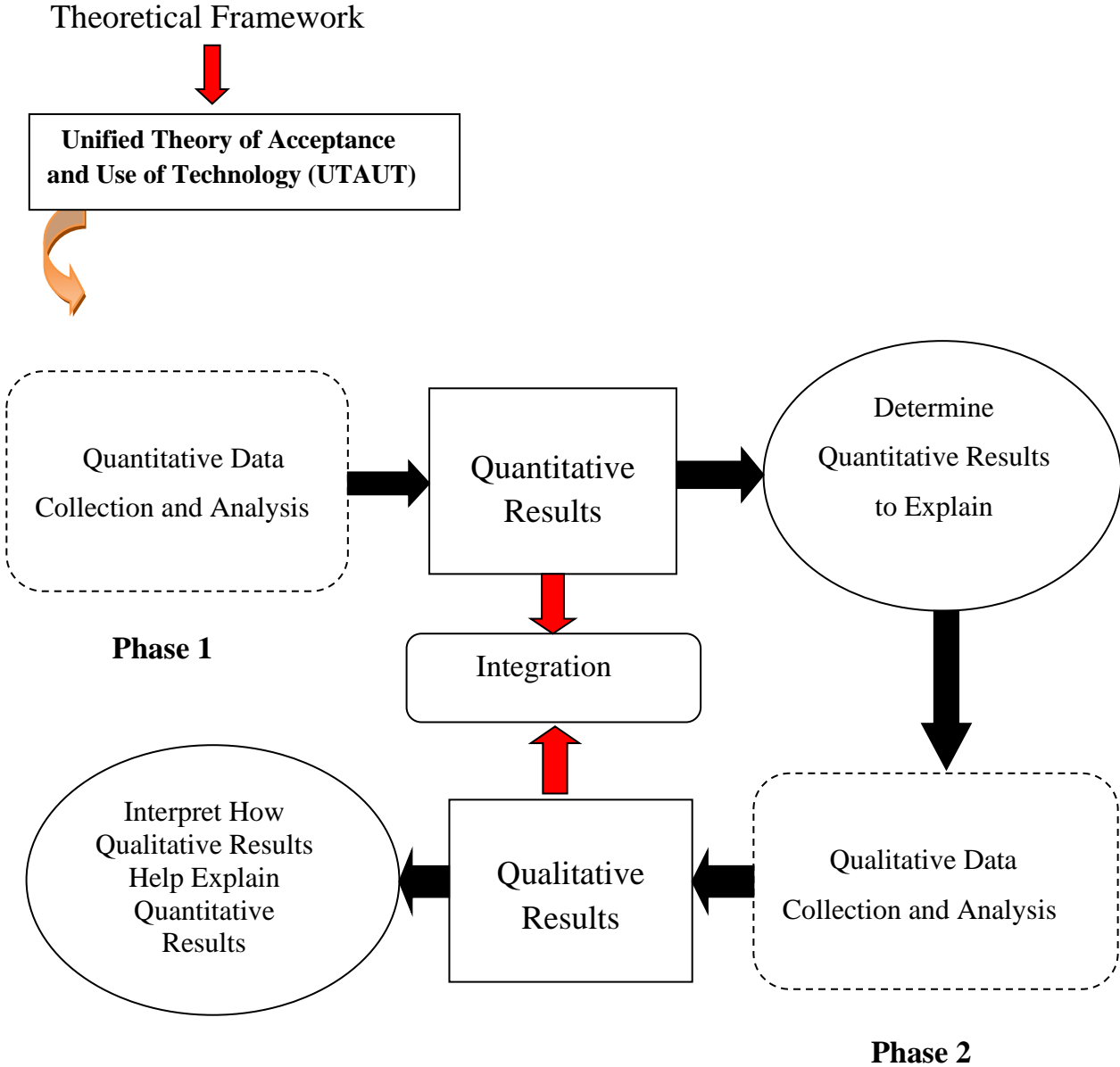
Phase 2

Figure 3.4 Explanatory Sequential Mixed Methods Design (Based on Creswell, 2020)

This study used an explanatory – sequential design albeit it also contains a preliminary phase in which we identified general themes through the conduct of semi-structured interviews with some Algerian EFL teachers from the Department of English at Hassiba Ben Bouali University of Chlef. This preliminary phase allowed us to develop a theoretical model that would best allow for the investigation of the determinants that might influence teachers' Information Technology acceptance and usage, as well as the

hurdles to such acceptance and use in the context of the study (The revised UTAUT model that resulted has been addressed in more detail in Chapter 1).

As explained above, a sequential explanatory design was used in the current study so data from the semi-structured interview could help explain the quantitative results for the purpose of complementarity. The data were connected and the quantitative phase helped inform the qualitative phase. This connection happened in two places. The first connection of the quantitative and qualitative phase was the use of the quantitative results to create the semi-structured interview questions (see Figure 3.4 above). The second connection was the mixing that happened after the qualitative data were collected and analysed. The results were connected to gain a better understanding of the findings from both phases (see section 3.8.2 .3 for further details). Philosophically speaking, this design application is driven by a *pragmatism* orientation in which the primary aim of the study (as a quantitative phase) dominates the design. This means that investigators using this design place emphasis on the quantitative, meaning more weight is placed on the quantitative phase.

As introduced earlier in Section 3.2, different *philosophical assumptions* are possible to guide the use of an explanatory design. Questionnaire-based quantitative research and interview-based qualitative research have been chosen for this study. Because *positivism* and *post-positivism* are connected with quantitative methods, whereas *interpretivism* and *constructivism* are linked with qualitative methods, this mixed-methods approach can be perceived as merging incompatible paradigms (Creswell, 2014). Since the explanatory design begins quantitatively, the research problem and purpose often call for a greater importance to be placed on the quantitative aspects (Creswell & Clark, 2018).Reviewing the existing literature, researchers in the explanatory design prioritise the quantitative data and analysis and collect these data first. The qualitative study (Phase 2) is used very often in the service of the more dominant quantitative study (Phase 1) to '*follow-up'* on some issues or results that the researcher seeks to understand more in depth, perhaps refining some particular quantitative measures for a subsequent survey (Hesse-Biber, 2010). In this type of model, researchers analyse and interpret quantitative data, which guides the design of a follow-up qualitative protocol. Qualitative results exist to explain first-phase findings,

making this thread secondary to its quantitative counterpart (Meixner & Hathcoat, 2019). Thus, this explanatory sequential design gives priority to the quantitative aspects of the research project (Creswell, 2003; Hesse-Biber, 2010; Creswell & Creswell, 2018).

Although some mixed methods (MM) researchers argue that in the sequential QUAN to qual design priority typically is given to the quantitative component because it comes first in the sequence and thus carries more weight (Hesse-Biber, 2010; Robson & McCartan, 2016; Edmonds & Kennedy, 2017;Creswell & Clark, 2018; Creswell & Creswell, 2018), it is not always the case. Other researchers argue that priority is not a design characteristic and should be determined by what data provides more insight into the study's research questions (e.g., Ivankova et al., 2006; Ivankova & Stick, 2007). Such decisions could be made either at the study design stage before the data collection begins or later during the data collection and analysis process (Ivankova et al., 2006).

One's choice to prioritise a qualitative strand over its quantitative counterpart would result in a truncated capitalisation of qualitative (i.e., 'QUAL') and lowercase, italicised denotation of quantitative (i.e., '*quan*') as the case of this explanatory sequential design of the current study. Despite the fact that 'QUAN →qual' is a standard in this design, there are known deviations (Meixner & Hathcoat, 2019), and a researcher may give the priority to the qualitative data collection and analysis depending on the study goals, the scope of quantitative and qualitative research questions, and the particular design of each phase 'quan →QUAL'(Ivankova et al., 2006). For instance, in a study conducted by Ivankova and Stick (2007), the priority was given to the qualitative approach in her sequential explanatory mixed methods design. The qualitative phase is often emphasised when using the participant-selection design (Edmonds & Kennedy, 2017) – that is, explanatory sequential design needs quantitative results to help select best participants. It places priority on the second qualitative phase. Hence, the present study advocates the same direction because it focuses on in-depth explanations of the results obtained in the first quantitative phase, and involves extensive data collection from multiple sources and two-level case analysis. In this case, the mixed methods design scenario foe the present research is quan →QUAL. Therefore, the decision to give priority to the qualitative data collection and analysis is in fact influenced by the purpose of the current study to identify and explain the factors that influence EFL teachers' acceptance and use

of ICT in their teaching practices. Therefore, in discussing the motivations for using a mixed methods approach, we use the capitalised term 'QUAL' to denote the dominance of the qualitative component of a study in a qualitative approach to mixed methods research design; the lowercased term 'quan' is used to indicate the auxiliary role of the quantitative component (Hesse-Biber, 2010) in the figures on mixed methods designs shown throughout this Chapter.

We adopted the explanatory – sequential design for this study to collect primarily quantitative data on the experiences and attitudes of EFL teachers at Hassiba Benbouali University of Chlef. According to this design, quantitative, numerical data are gathered and analysed so that factors that seem to have a significant impact on technology acceptance and use can be identified and further explored in semi-structured interviews to explain why these factors are important and clarify any questions about the results. As a result, the quantitative data provide a general view of the research problem while the qualitative data collected in Phase Two refine and explain the findings. In this mixed-methods approach, data collection is carried out in two stages, with informants for Phase Two recruited from participant pool for Phase One. Indeed, in this study, survey respondents are asked to indicate whether or not they are willing to be interviewed in order to ensure their availability. Although the majority of the questions in Phase One are closed-ended, the questions in Phase Two need to be largely open-ended to allow interviewees to elaborate on the topic. Furthermore, even though Phase One established the interview protocol, interviewees need to be allowed to bring up other related themes that they believe are essential. In regard to the interpretation of data from the two phases, it is also necessary to analyse how qualitative data expands and explains quantitative data, as well as how these two sets of data might be merged.

The data collected in Phase One allows for a more systematic and reliable analysis of variables than would be possible with a large number of qualitative data. Also, this quantitative approach generates results that can be represented in statistical terms, making generalisations easier. In contrast, the qualitative approach is typically used to explain certain social phenomena in greater depth (Hesse-Biber, 2017). Qualitative research advocates (e.g.Given, 2008) argue that the complexity of social phenomena requires that researchers employ open-ended research designs and use research methods

that allowed researchers to tap their tacit knowledge. Fundamentally, qualitative research contributes to the social inquiry which aims to interpret '*the meanings of human actions*' (Liamputtong, 2019). The mixed approach boosts confidence in the findings and assures that they are accurate and rational, while also disclosing in-depth knowledge about the phenomenon and providing results that can be generalised to the entire population under investigation (Zalah, 2018).

To address the research questions and hypotheses in relation to the theoretical model of technology acceptance, the data from the survey and interviews need to be properly integrated. The approach is both *pragmatic* – as it is amenable to making use of both quantitative and qualitative data – and makes use of critical realism because it accepts that although there is an objective reality concerning the extent to which Algerian University teachers accept and use Information Technologies, it is only possible to observe part of that reality. Hence, to understand the phenomenon, the researcher needs to explore it at the level of the individual teachers' experience. Regardless of the approach taken, the goal of a sequential research design is to leverage the findings from the first study to inform the second study and add richness to the overall study (Venkatesh et al., 2013).

Nowadays, the increase in mixed methods research justifies the question of determining the perceived value of mixed methods research compared with a purely quantitative or purely qualitative study. It is critical to understand the perceived value of combining two distinct methodologies, especially given the added resources, time, and expertise required to conduct a mixed methods study (McKim, 2017). Although a mixed methods approach clearly has certain advantages over a mono-method approach, it is not a silver bullet to problems that are associated with any single method (Venkatesh et al., 2013). There are also a few challenges and limitations with the mixed methods that must be acknowledged, but it is outside the scope of the current research. The essential aspects of the population and sampling procedures are described in the next section.

3.4. Study Population and Sampling

In the conduct of an investigative study, it is vital for the researcher to identify the target population and the size of his/her sampling. *Sampling* means taking an appropriate portion of the population that can represent it without bias.According to Faryadi (2019),a good sampling indicates that you have selected an adequate number that is representative of the target population statistically so that you can make informed conclusions about your results based on the collected data.

When conducting mixed methods research, it is essential to determine the optimum sample sizes for both the quantitative and qualitative phases. The selected sample size needs to be justified (Field, 2013, 2018). As this study involves an explanatory – sequential design (see Section 3.4.2), the use of nested samples was considered appropriate. This involves using a selection of informants who completed the Phase One questionnaire and volunteered to be interviewed for the Phase 2 semi-structured interviews.

We use a sampling procedure to answer a research question or hypothesis which includes identifying the research location or site, the informants who will offer data in the study and how they will be selected, and the number of informants needed to answer the research questions. These steps in data collection apply both to qualitative and quantitative research, although there are fundamental differences in how they are typically addressed – especially in terms of the sampling approach and the sample size. How well a sample represents a population depends on the sample frame, the sample size, and the specific design of selection procedures (Fowler, 2014).

3.4.1. Identification of the Target Population

The process begins with defining the *target population* and specifying the *sampling frame*. The *target population* is the main population of the research study, and it is a subset of the overall population (Saunders et al., 2016, 2019) and is the actual focus or target of the research inquiry (see Figure 3.5 below). A *sampling frame* involves information about the research population. It usually takes the form of a list of names or email addresses that includes all members of the population to be sampled (see Denscombe, 2010, for the main characteristics of a good sampling frame). A study

population (sometimes called the *sampling frame*) is the group of elements from which the sample is actually drawn (Leavy, 2017; Saunders et al., 2019). In a sequential design, you may wait to carry out data collection and analysis with your first method and then determine the best sampling strategy for the second method. Statistically speaking, a sample only can be representative of the population included in the sample frame (Fowler, 2014, p. 14). The target population for this research study was the entire EFL teaching staff of Algerian Higher Education Institutions. However, this study is limited only to the University of Chlef, a University in the West of Algeria. The institution includes nine faculties and one institution. In this regard, in selecting my sample from this target population, we have narrowed the focus of our research specifically to English as a Foreign Language (EFL) teachers at the Department of English at Hassiba Benbouali University of Chlef.

Before diving into the many approaches to sampling that a survey researcher can employ, it is vital to understand the difference between the terms '*population' and 'sample'*. The term '*population'* has a special meaning in the context of surveys and sampling (Figure 3.5). It refers to all of the items in the category of things being investigated. It refers to a study population. As a result, the current research's survey is being used to investigate EFL teachers at the University of Chlef in the West of Algeria. In this context, the *survey population* refers to all EFL teachers working in Algeria (not all Algerians), and the *sample* refers to the EFL teachers who are chosen to participate in the study (EFL teachers from the Department of English at the University of Chlef).
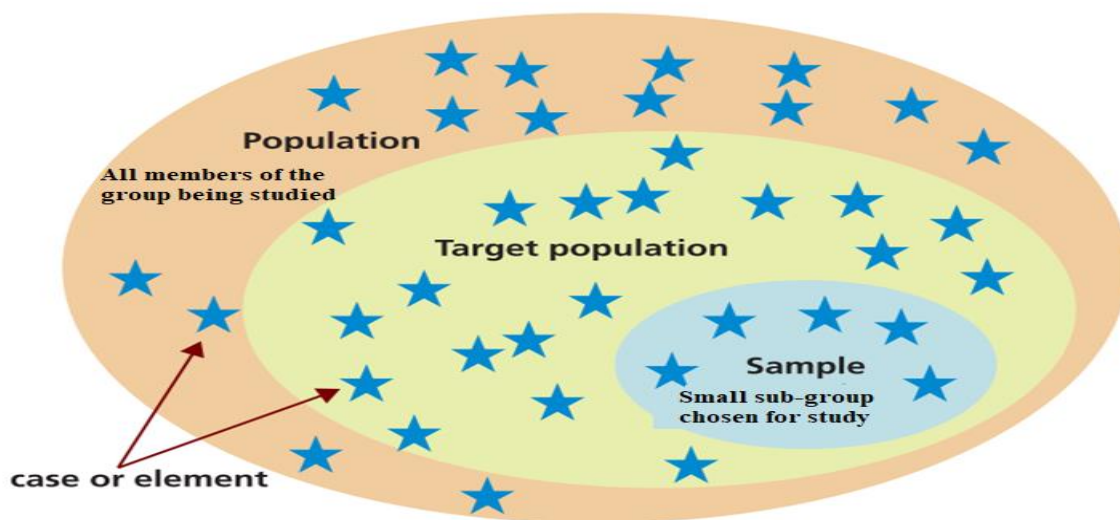
Figure 3.5 Population, Target Population, Sample and Individual Cases

In conclusion, the goal of sampling is to obtain a sample that accurately reflects the population that is meant to represent. This entails defining the population, obtaining an unbiased sampling frame, and using probability sampling methods to select a sample. This should yield a final sample that is smaller than the population but has a matching 'shape' to the population. The following Figure 3.6 adopted from De Vaus (2002) shows the process of moving from the population to sample size.

Overall Population

(All Teachers in the HEIs of Algeria)

Target Population

(All Teachers in the Western Province of Algeria)

Sampling Frame

Users of ICT at the Department of English

Sample Size
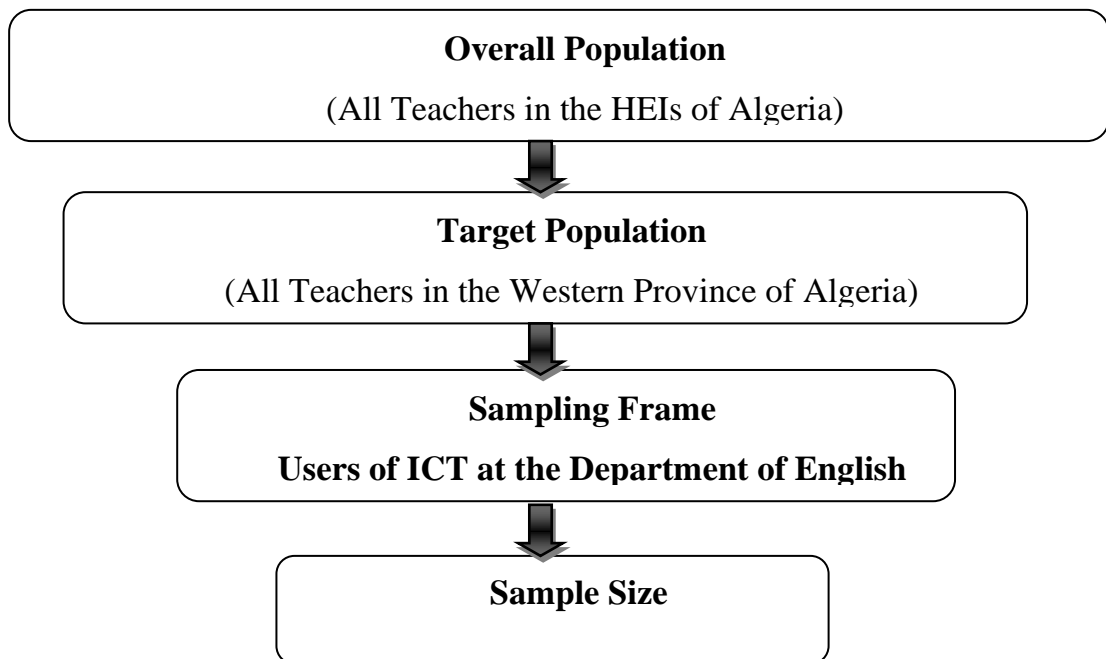
Figure 3.6 Moving from Population to Sample. Source: de Vaus, 2002

As mentioned in Chapter 2, the target population in this study was all EFL teachers at the Department of English at Hassiba Benbouali University of Chlef. The sampling frame for this study was based on a list that was provided by the Head of the English Department at the University of Chlef during the Academic Year 2020–2021. The total number of Algerian Higher Education EFL teachers at the University of Chlef was 45 according to the Summary Statistics on the official web page of Moodle at the University in the Academic Year 2020/2021 ('Teaching and Administrative Staff,' 2021). This number is classified by gender in Table 3.1. The Head of the English Department provided contact information (email addresses) for all EFL teachers in the Department.

Table3.1 Distribution of the Population According to the Department of English at Hassiba Benbouali University of Chlef

University	Female Teachers	Male Teachers	Total Number of Teachers
Number of EFL Teachers at the Department of English Hassiba Benbouali University of Chlef	28	17	45

The selection of informants in a mixed method study includes both probability/nonprobability quantitative approaches to sampling and purposive qualitative approaches (McMillan & Schumacher, 2014). Many studies use a convenience or available sample for the quantitative phase of the research in which quantitative data are gathered. Although the term random is used to describe the method of selecting the cases, it does not mean that the results can be generalised to the population. Rather, the strategy is used to provide qualitative results that complement quantitative findings. The sampling could occur either before or after the quantitative phase. It is more typical, however, for the sampling design to follow from the logic of the research questions. If the first question is clearly quantitative, then some kind of quantitative sampling process will be used, followed by a qualitative type of sampling. This is the most common sampling sequence in mixed method studies (McMillan & Schumacher, 2014).

In mixed methods research (MMR), both quantitative and qualitative sampling strategies are used. Probability sampling is generally used in quantitative research, and purposeful sampling is generally used in qualitative research (Leavy, 2017). In addition, sample size is one of the most important considerations about how sampling affects research which is discussed in the next section.

3.4.2. Determining the Sample Size

The size of the sample, or the number of participants, is a critical factor to consider while conducting and evaluating research (McMillan & Schumacher, 2014, p. 154). When conducting mixed methods research in particular, researchers must take into account both the quantitative and qualitative phases of the investigation (Collins & O'cathain, 2009). Since the present study involves a sequential design (the quantitative phase followed by qualitative phase), the use of nested samples is deemed to be appropriate for the purposes of this study. Nested samples indicate that the sample members selected for the qualitative phase of the study represent a subset of those participants chosen for the quantitative phase (Creswell & Clark, 2018). In a similar vein, McCrudden and McTigue (2019) claim that a researcher may use a nested sampling strategy in which the quantitative phase's results are used to pick individuals or cases for the subsequent qualitative phase which is a type of connecting.

Onwuegbuzie and Collins (2007) point out that sampling designs have two important components: the *sampling scheme* and the *sample size*. The *sampling scheme* refers to the specific strategies used to pick units (e.g., persons, groups, locations, and events), whereas the *sample size* refers to the number of units chosen for the study. Hence, in mixed methods studies, the researcher must make *sampling scheme* and *sample size* considerations for both the qualitative and quantitative phases of the study. Therefore, mixed methods sampling designs represent the framework within which the sampling occurs, including the number and types of sampling schemes, as well as the sample size (Collins et al., 2007).

Sampling addresses the questions, 'Who or what is in your study? Where are you getting your data or content?' Typically, discussions of sampling centres around who is in your study – the subjects, respondents, informants, or collaborators (Leavy, 2017). The challenge of representation refers to the fact that sampling problems characterise both quantitative and qualitative research. Hence, in mixed methods studies, the challenge of representation refers to the difficulty in capturing (i.e., representing) the lived experience using text in general and words and numbers in particular (Collins et al., 2007). Thus, the principle of sampling is that accurate results can be obtained
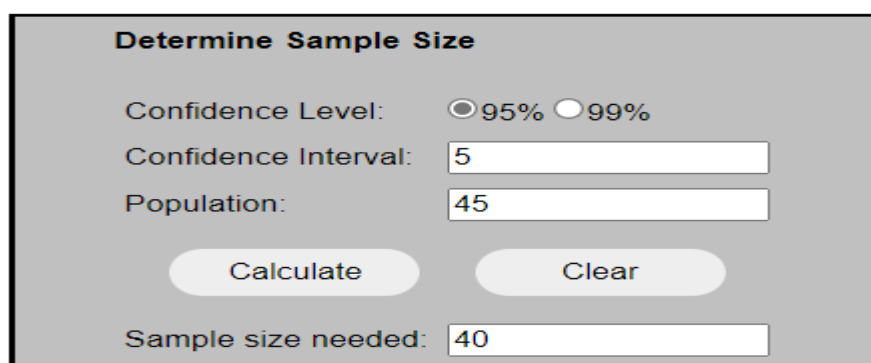
without collecting data from every single member of a survey 'population'. (Denscombe, 2010).

In quantitative studies, the number of independent, individual units of study become the sample size, represented by the letter n (the size of the population is N). There are several methods for determining the required sample size in quantitative research (see Table 6.4 McMillan & Schumacher, 2014 rules of thumb for estimating adequate sample size for quantitative studies).The challenge with such procedures is that they do not take into account the expected outcome effect size or the desired power of analysis (Al Harbi, 2014).The current study included four independent variables: (1) Performance Expectancy, (2) Effort Expectancy, (3) Social Influence, (4) Facilitating Conditions (see Section below for full discussion of the variables of this research). A total of 34 questionnaires were returned with a rate of 78.6%. The results of these questionnaires are provided in Chapter 4.

In quantitative research, the vast majority of studies use sample sizes that are too small to detect statistically significant differences or relationships (i.e., statistical power ranging from 4 to 6, with an average statistical power of.5)(Collins et al., 2007). If probability sampling procedures are used, the precision of sample estimates can be calculated (Fowler, 2014). Thus, Table 3.2 represents the sample size found for a total population of 45 EFL teachers from the Department of English at Hassiba Benbouali, University of Chlef for the Academic Year 2020–2021, using an online sampling calculator (available at http:// www.surveysystem.com/sscalc.htm), with a confidence level of 95% and a confidence interval of 5%. The sampling size is 40 which is similarly indicated in other research studies for determining sample size (see Table 2 Halim & Hasnita, 2017). Hence, we are confident about the sample size in the current research.

Table 3.2 Calculation of Sample Size by Applying the Online Survey System Equation

In qualitative research, determining the right sample size is a more contentious problem (Collins et al., 2007) and a disputed matter (Vasileiou et al., 2018; Zalah, 2018). However, in general in qualitative research, the sample size should not be too small as it makes it difficult to obtain data saturation. At the same time, it should not be so large that the ability to achieve a deep, rich understanding of the cases being studied is lost (Collins et al., 2007; Onwuegbuzie & Leech, 2015). It is all about a balancing act between representativeness and saturation in qualitative research (Teddlie & Yu, 2007). While the quantitative research community has established relatively straightforward statistics-based rules for precisely setting sample sizes, the complexities of qualitative sample size determination and assessment stem from the methodological, theoretical, epistemological, and ideological pluralism that characterises qualitative inquiry (Vasileiou et al., 2018).In qualitative research, there has been an increasing demand for an evidence-based approach to sample size determination and evaluations of the sample size sufficiency throughout the last decade. (Vasileiou, Barnett, Thorpe & Young, 2018).However, qualitative research experts argue that there is no straightforward answer to the question of '*how many*' and that sample size is contingent on a number of factors relating to epistemological, methodological and practical issues (e.g., Vasileiou et al., 2018).

While some experts in qualitative research avoid the topic of '*how many interviews*' are enough,' there is indeed variability in what is suggested as a minimum. An extremely large number of articles, book chapters, and books recommend guidance and suggest anywhere from 5 to 50 participants as adequate (Dworkin, 2012). For instance, in a study conducted by Guest et al. (2006) in a healthcare context revealed that 12 interviewees were enough to yield relevant data and to be sufficiently representative. These authors also found that the basic meta-themes were revealed in the first six interviews .Based on this and on Stake's (2006) recommendation of sampling 4 to 10 informants, we determined the sample size for the qualitative part of the current study to be six interviewees (two female and four male teachers) who were selected for the semi-structured interviews in the Department of English from those survey informants who had provided contact details as an indication that they were willing to be interviewed. Therefore, the sample of interviewees is selected from the sampling frame of all survey

informants consenting to be interviewed. We involved a request for interviewees on the last page of the questionnaire, such that respondents who were willing could provide their email addresses to us directly.

As the interview sample is taken from teachers who have volunteered to be interviewed, it should be noted that such self-selection means that the final sample can be biased, as the volunteers may be those responding informants who feel strongly about the topic or simply have more time than those who have not volunteered. However, the purpose of the interviews is to explore the issues of the factors that influence EFL teachers' Information Technology acceptance in more depth than revealed in Phase One of the current study, and the purposive selection targets specific individuals rather than making generalisations. The final sample is therefore a purposive sample depending on the informants' levels of acceptance and use of educational technologies, their teaching experience, and attitudes about using these technologies as identified by the revised UTAUT model.

Undoubtedly, the most widely used principle for determining sample size and evaluating its sufficiency is that of *saturation* (Vasileiou et al., 2018). Most scholars argue that the concept of *saturation* is the most important factor to think about when mulling over sample size decisions in qualitative research. *Saturation* is defined by many scholar researchers as the point at which the data collection process no longer offers any new or relevant data (Dworkin, 2012). In qualitative research, the challenge of representation refers to the difficulties researchers encounter in capturing lived experiences via their social texts (Collins et al., 2007). Hence, the second phase of the current study which is positioned in qualitative research, with a cross-sectional design, was carried out by means of semi-structured interviews, from September to October 2021, and the sample representativeness criterion to stop collecting data was discourse saturation.

This area covered sample size and the next section deals with sampling methods used in the research study covering the factors that influence Information Communication and Technology use by EFL teachers in the Algerian Higher Education Institutions.

3.4.3. Sampling Methods

The question of sampling arises in terms of collecting both quantitative and qualitative data in mixed methods (Creswell, 2015a). Hence, it is helpful to consider how sampling proceeds within each of the major designs in research. As explained above, sampling occurs at two points in this explanatory sequential mixed methods study: the *random sampling* in the quantitative phase and the *purposeful sampling* in the qualitative phase.

Since the current explanatory sequential mixed methods study aims to explain initial quantitative results, the informants for the qualitative follow-up phase are a subset of informants who participated in the quantitative data collection. The intent of this design is to use qualitative data to explain the quantitative results in greater depth, and the individuals best suited to do so are ones who contributed to the quantitative data set. Hence, sampling needs to be rigorous in both the quantitative and qualitative strands of a mixed methods study. Thus, issues such as sampling and sample size depend on the features of the type of mixed methods design being used (Creswell & Clark, 2018).

3.5.   Variables, Hypotheses and the Research Framework

● *Variables*

It has been noted in section 1.4 regarding the use of the revised UTAUT model that the independent variables of this study are Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitude toward Using Technology, while the dependent variables are Behavioural Intention to use Information Technology and the Use Behaviour of ICT. In addition, gender, age and teaching experience are potential moderators in the relationships between the independent and dependent variables. This section is a discussion of the various variables incorporated within the generic framework and the various moderating variables. Thus, the variables considered for the present study are divided into four groups: dependent, independent, intervening, and moderating variables (see Figure 3.7).

Dependent Variable: Actual Use of ICT is measured on a Likert-type 5-point scale to understand ICT usage among the informants.

Independent Variables: It includes four psychological variables as predictors of 'Behavioural Intention' variable. The information pertaining to each of the following four psychological variables is measured on a Likert-type 5-point scale:

1. Performance Expectancy
2. Effort Expectancy
3. Social Influence
4. Facilitating Conditions

Intervening Variables (also commonly called a mediating or mediator variable)

It includes two psychological variables as predictors of (in) dependent variable. The information pertaining to each of the following two psychological variables is measured on a Likert-type 5-point scale:

1. Attitude Towards Technology Use
2. Behavioural Intention

However, in the context of the current study the two intervening variables will be added to the aforementioned 4 independent variables resulting into a total number of six (6) independent variables. In this regard, the terms *independent variable* and *dependent variable* are often employed. The former denotes a variable that has an impact upon the dependent variable. The latter, in other words, is deemed to be an effect of the independent variable. This causal imagery is widespread in the social sciences and a major role of multivariate analysis is the elucidation of such causal relationships (Bryman, 1988 as cited in Bryman & Cramer, 2011). Hence, the ease with which a researcher can establish cause-and-effect relationships is strongly affected by the nature of the research design (Bryman & Cramer, 2001, 2011).

Moderating Variables:

Bearing in mind the likely moderating variables 'when investigating ICT acceptance and usage "will help predict some of the conflicts between the variables or the variances in the explanation of power found between the several adoption models/theories in the literature. A moderating variable is an interacting term which is said to emerge when the relationship between independent and dependent variables is surprisingly weak or inconsistent relationship or no relationship at all, thus the moderating variable is introduced to reduce or strengthen the relationship (Obienu & Amadin, 2021).

The moderating variables include socio-demographic variables pertaining to informants' characteristics.

1. Gender
2. Age: Male/Female
3. Teaching experience: Number of Years

A moderating variable alters the effect that an independent variable has on a dependent variable, on the basis of the moderating value. The moderating thus changes the effect component of the cause-effect relationship between the two variables. This moderation is also referred to as the interaction effect (Swaen, 2015).
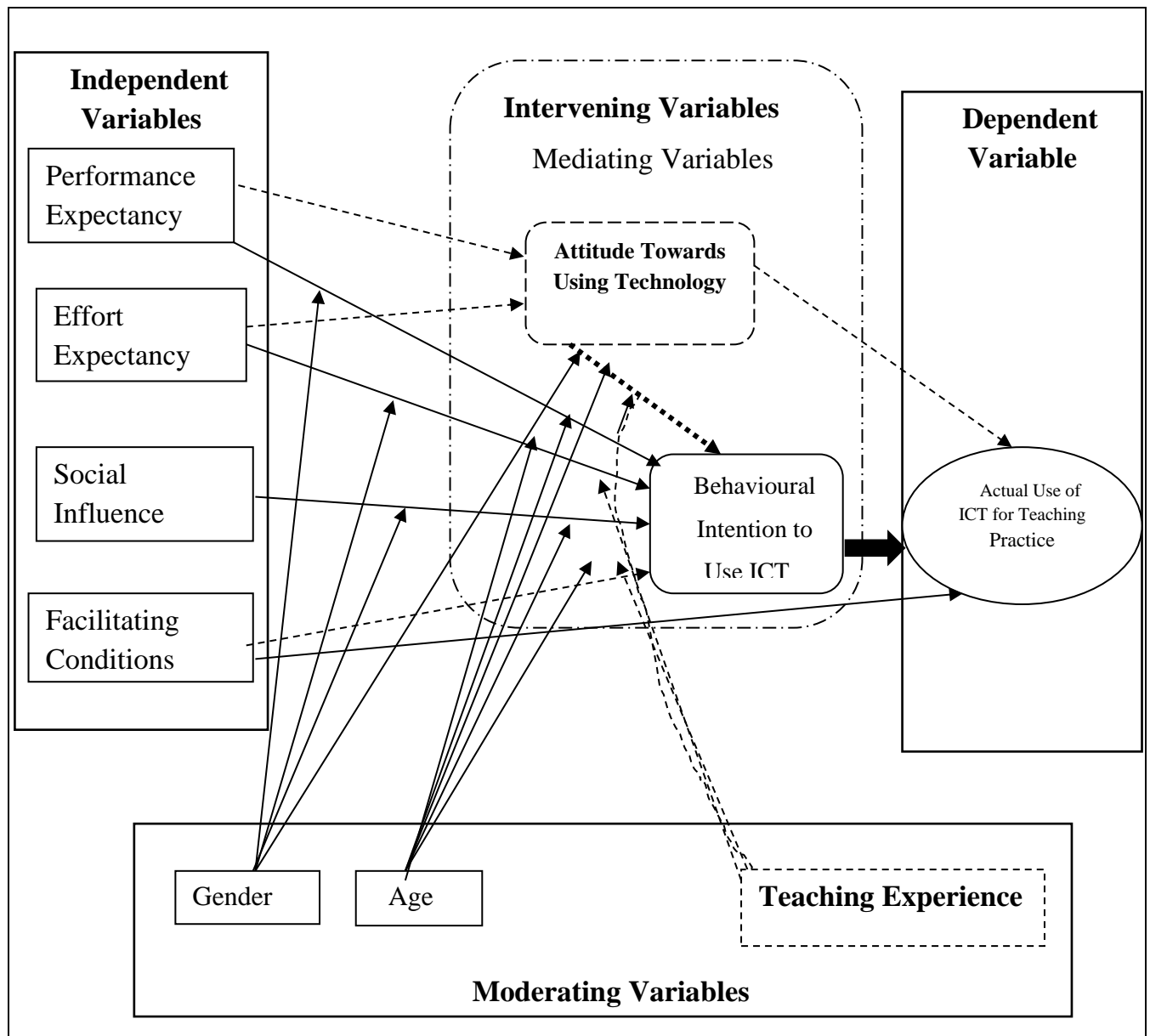
Figure 3.7 Variables of the Study

For shorthand, we could use IV to stand for independent variable, IV to stand for intervening variable, MV to stand for Moderating Variable, and DV to stand for dependent variable. We also sometimes use an arrow: IV ➔ IV ➔ DV. The arrow ➔ means "tends to cause changes in" or "affects." In words, this says that the researcher believes "changes in the independent variable tend to cause changes in the dependent variable." The independent variables are described in Table 3.3 below.

Table 3.3. Explanation of the Independent Variables Used in the Research Model

Construct	Code	Description
Performance Expectancy	PE	How much the teacher believes that ICT will assist them in performing better in their job.
Effort Expectancy	EE	How easy it is to access and use ICT.
Social Influence	SI	The extent to which teachers are affected by people within their circle of influence e.g., colleagues or friends.
Facilitating Conditions	FC	The extent to which a teacher believes that there are adequate resources i.e., technical infrastructure to support their use of ICT.
Attitude towards Using Technology	ATUT	The overall reaction to using ICT.

● *Formulation of Hypotheses*

As previously stated, the current investigation entails a web of relationships between a number of independent factors, two intervening variables, and a dependent variable through the mediation of some socio-demographic characteristics of teachers (such as age, gender, and teaching experience). As a result, hypotheses about the linkages between perception, attitude, intention, and ICT use among teachers have been formulated.

The variables of the extended model of UTAUT serve the objectives and research questions established for this study. Based on the revised research model of UTAUT, the following seven hypotheses are presented:

Hypothesis 1:

There is a significant relationship between Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, Behaviour Intention and Actual Use of ICT among teachers.

Hypothesis 2:

Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions will have a positive effect on teachers' *Attitude toward Using Technology*.

Hypothesis 3:

Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude toward Using Technology will have a positive effect on teachers' Behavioural Intention to use ICT.

Hypothesis 4:

Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology and Behavioural Intention will have a positive effect on teachers' Use Behaviour towards the Use of Information Technologies.

Hypothesis 5:

Gender will moderate the effect of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude toward Using Technology on teachers' Behavioural Intention to use ICT.

Hypothesis 6:

Age will moderate the effect of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude toward Using Technology on teachers' Behavioural Intention to Use ICT.

Hypothesis 7:

Teaching experience will moderate the effect of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude toward Using Technology on teachers' Behavioural Intention to Use ICT.

● *Research Framework*

The overall objective of the present study was to assess the predictors and moderators of the proposed UTAUT model that influence the acceptance and use of ICT among English as a Foreign Language (EFL) teachers in the Algerian Higher Education Institutions (HEIs). Based on the above discussion, the following theoretical framework is derived (Figure 3.8).
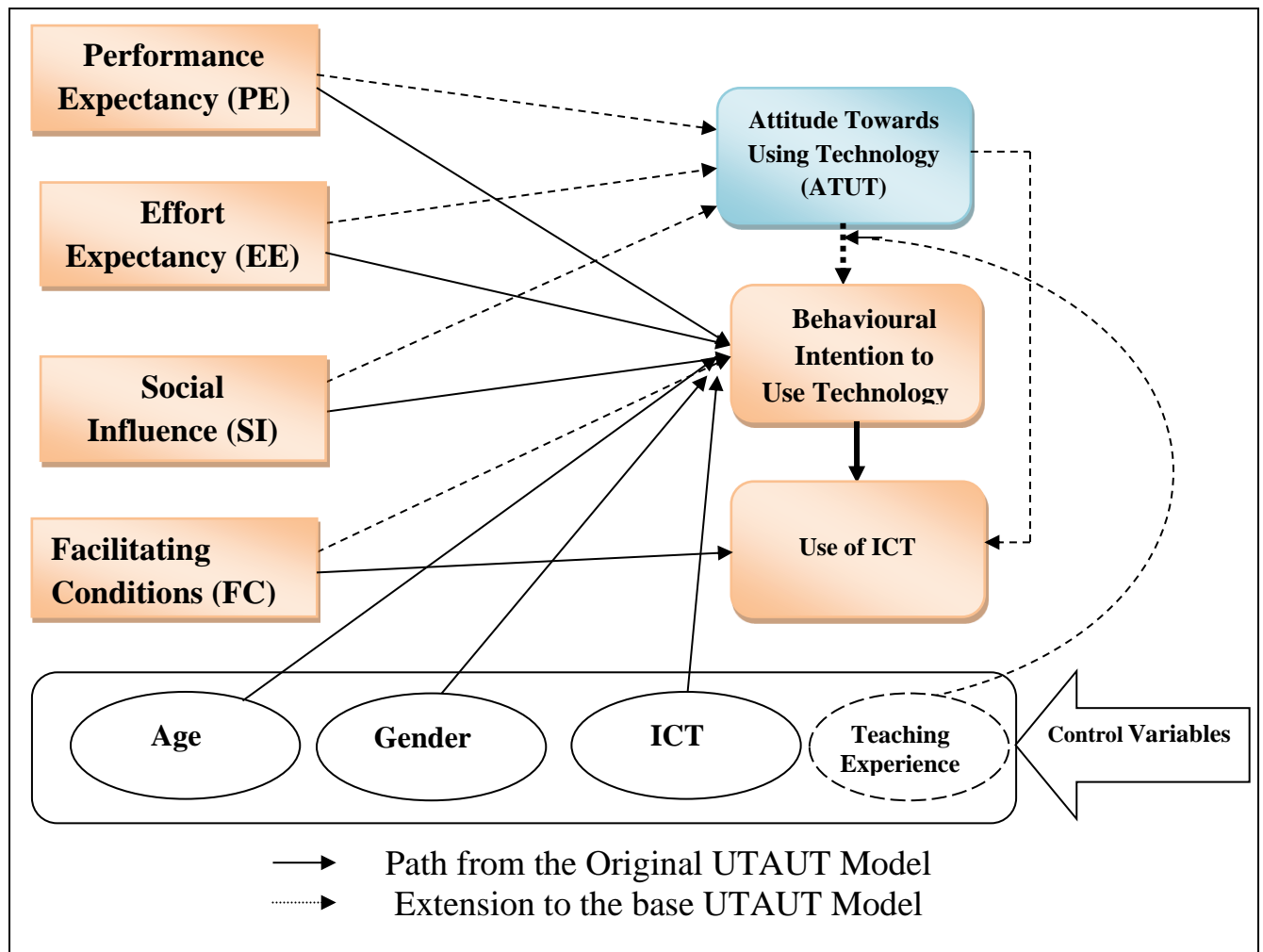
Figure 3.8 Proposed Theoretical Research Model (Venkatesh et al., 2003)

The proposed research framework posited above in Figure 3.8 was empirically tested with a quantitative survey by many researchers across the world. Data collected were aggregated and pooled across a number of different learning innovations (Learning Management Systems such as Moodle, Edmodo, Google Classroom, Canvas; Virtual Learning Environment; Interactive Smartboard; Digital Library; Google Apps for Education). In the context of the current study, UTAUT model was adapted with required modification to suit to the Algerian Higher Education context. Moreover, it extended the causal relationships by including *Attitude towards Using Technology*, and the construct of Facilitating Conditions was linked directly to Behavioural Intention instead of only Use Behaviour. Teaching experience is another moderating variable that was proposed in this study in order to supplement the variable experience in using a certain technology from the base UTAUT model. Based on the nature of this study,

voluntariness was dropped from the set of moderators of the original UTAUT model and thus only three moderators (age, gender, and experience) were used to replicate the original UTAUT.

The UTAUT model is applied to understand the impact of various independent variables on use of ICT among University EFL teachers. For the present study, the model has measured the influence of six independent variables, namely; Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, and Behaviour Intention and three socio-demographic variables as moderators (gender, age, and teaching experience) on actual use of ICT among University teachers. Thus, the rationale behind the selection of UTAUT is its comprehensiveness and flexibility that can be evidenced by different technologies and/or users' groups (Venkatesh, Thong, & Xu, 2012; Shah, Khan, Khan, Khan, & Xuehe, 2020). The key concepts of the Unified Model have already been discussed in the preceding headings of the theoretical background of the current study.

As the framework of the study was designed to cover all research questions and hypotheses, the mixed methods methodology was deemed appropriate in order to understand in-depth the effects of psychological and socio-demographic factors on teachers' acceptance and use of ICT in EFL classrooms. This methodology involved the use of online questionnaire in addition to face-to-face semi-structured interviews. Therefore, a new modified theoretical framework which was explained in the Review of Literature Chapter has been developed in order to cover all the issues related to the research questions and hypotheses.

3.6. Research Tools

In the current study, we adopted an explanatory sequential mixed methods approach which included both quantitative (Online Questionnaire) and qualitative (Semi-Structured Interview) methods, with the strengths of one method compensating for the deficiencies of the other. According to Kajamaa et al. (2020), mixed methods research (MMR) or multi-strategy designs can be defined as the collection, analysis, interpretation and integration of both quantitative and qualitative data at different stages of the research process. MMR has gained traction in the social sciences, evolving as a

genre of inquiry that intentionally and systematically connects qualitative and quantitative methods in order to address substantive questions (Meixner & Hathcoat, 2019). Hence, a mixed-methods approach was selected because '*the combination of quantitative and qualitative approaches provides a better understanding of research problems than either approach alone*'(Creswell & Clark, 2018).

An anonymous online questionnaire was used for collecting the data from the sample informants in Phase I. It was constructed to elicit information regarding the research questions that the study set out to answer. The questionnaire (Appendix B) included five-point Likert-scale items ranging from strongly disagree (1) to strongly agree (5), open-ended and multiple-choice items. The survey item was organised into two sections (see section 3.8.1.1 for full discussion). The first section focused on demographic information and usage experience of ICT and the second section contain statements assessing the constructs that have been adapted using the UTAUT model (Venkatesh et al., 2003). These constructs include Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude towards Using Technology, Behavioural Intention, and Actual Usage of ICT. As mentioned earlier, all informants were given the opportunity to indicate on their questionnaire whether they would be interested in participating in a follow-up semi-structured interview, which occurred in June 2021.

In Phase II, the semi-structured interview (Appendix G) comprised of numerous questions designed to elicit further information and explanations from teachers. To gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study about the usage of ICT, the interview informants were chosen via purposeful sampling. That is, this study uses the qualitative data to illuminate answers given by informants on the questionnaire and determine whether any issues outside of the UTAUT factors influence EFL teachers' acceptance and use of ICT. Quantitative data and analyses (using surveys, experiments, and statistical analysis of data) are often at the centre, with qualitative data used in the service of enhancing a primarily quantitative mixed methods approach (Hesse-Biber, 2010). As such, the qualitative phase is connected to and depends on the quantitative results (Creswell & Clark, 2018).

3.6.1. Pilot Testing

Before being administered to the informants, the data collection tools, consisting of a questionnaire in Phase I and interview guide in Phase II, were tested for validity and reliability. The researcher conducted a pilot study to determine the validity and reliability of data collection tools. Five percent (5%) of the Target Population was used as the sample size for the pilot study as suggested by Mugenda & Mugenda,2003 as cited in Nyawanda (2014). Both the questionnaires (with 36 items of the seven constructs and 1 open-ended question) as well as semi-structured interview questions were used in the pilot study. Hence, five EFL teachers from the Department of English at Hassiba Benbouali University of Chlef constituted the sample size for the pilot study. The tools were administered to the informants and the obtained information were analysed and used to revise the research tools to ensure that they clearly captured the variables under study allowing for generalisation to the entire population. Hence, all data-gathering research instruments should be piloted to test how long it takes respondents to complete them, to verify that all questions and instructions are clear, and to eliminate any items that do not yield useful information (Bell, 2010). The pilot data was not included in the actual study.

The primary objective of the pilot study in the current research for both the survey and the interviews was to identify issues with the closed-ended questions in the questionnaire and the open-ended questions in the interviews, to ensure that there was no ambiguity in the questions in either process, and to ensure that the questionnaire format and length did not alienate the target participants. Therefore, a pilot study allowed for further reflection on the nature, substance, and clarity of the questionnaire objectives, as well as testing the effectiveness of the interviewer's technique (Gall et al., 2003).

- **Piloting the Questionnaire**

To minimise measurement error, the construction of an online questionnaire included the following procedures. First, three teachers affiliated with one of Algeria's Higher Education Institutions were requested to participate in a questionnaire pre-test. Teachers were asked to check the content of the measuring items and to examine the meaningfulness, relevance and clarity of the questionnaire. Only two teachers returned

the questionnaire together with their observations. In response to the feedback, we modified the wording of the questionnaire. The main purpose of the pre-test was to improve the content of the measuring items. Following the pre-test, the questionnaire was pilot tested using a convenient sampling method. Hence, pilot informants were approached by the researcher directly, drawing on teachers known personally. These informants were chosen to ensure there would be a good spread of teachers who all taught different subjects and were both male and female.

After obtaining the email list of all teachers from the Head of the English Department, cover letter (Appendix A) and consent form were sent along with the questionnaire to three EFL teachers. The academic experts for the pilot were selected from among EFL teachers at Hassiba Benbouali University of Chlef. We emailed them and explained what was required for the pilot study. These teachers who agreed to participate were sent the questionnaire and asked for feedback. The feedback was then used to make some minor or surface changes to the wording and order of the items in each scale**.** Some overlapping items were also deleted from the questionnaire. It was also important to pilot the questionnaire to establish the amount of time needed for successful completion (Bell, 2010, p. 151). Therefore, a pilot study was conducted to check errors and rephrase questions that might seem ambiguous.

The main objective of the pilot test is to enhance the reliability, validity and the practical application of the questionnaire by clarifying, checking validity of questions, eliminating ambiguities (Cohen, 2008; Šumak & Šorgo, 2016).Hence, Walkman (2008) suggests that the best method of pilot is to test the questionnaire with persons who have relative expertise in the field, to anticipate any issues or sources of confusion. The data is analysed to assess the internal consistency of the measurement items. The reliability coefficient is calculated for each construct, where the lower bound for Cronbach's a is set at 0.7 (Šumak & Šorgo, 2016). The results of the statistical analysis confirm the appropriate reliability for all measurement items and finally all measurement items are accepted for the final distribution of the online survey to the informants.

- **Piloting the Interview**

The interview questions were reviewed by a number of academics and teachers to assess whether the language used was clear and unambiguous and whether the questions

would be effective in obtaining the required data. A pilot study carried out for two main reasons. First, to verify the interview questions and second, to obtain feedback from participants about the time of interview and what should be highlighted in the questions regarding the factors that affect teachers when they use ICT in EFL Classrooms.

The interview questions were reviewed beforehand face-to-face with a number of English-language teachers teaching in one of the Algerian Universities. They have rich experience in teaching the English language and publication of research articles, and during their teaching practice they have been involved in the use of ICT in the lessons. The teachers did not belong to the final sample selected for conducting the interview. The pilot study used just one interviewee to establish approximately how long the interview would take and whether the interview questions obtained the required results. The pilot interview was conducted with on one informant, purposely selected from those who had completed the survey in the first phase of the study. The informant received a covering letter (Appendix D) explaining that they should answer the questions and then give feedback; the covering letter assured the informant's anonymity and confidentiality. A consent form was signed at the interview, and the interview timed to get an idea of how long the main interviews would take. After the pilot interview, the interviewee also commented on the covering letter, the appropriateness, relevance and clarity of the questions, the length of the interview; and whether there were additional questions that could usefully be included.

The main goal for piloting the interview questions was to clarify what questions might seem unclear to the informants and to prevent misunderstanding in the process of conducting interviews of the study. After the pilot interview, any changes deemed necessary either for the procedure or the questions were made. Thus, the pilot study resulted in excluding repetitive questions and reformulation of unclear questions. The resulting interview schedule is displayed in Appendix E.

On the whole, the main purpose of a pilot exercise is to work out any faults in the instrument so that respondents in the main study have no trouble filling it out. It also allows the researcher to do a preliminary analysis to see if the wording and format of the questions will cause any problems when the main data is analysed (Bell, 2010). The next section explores the critical issues of *validity* and *reliability* in quantitative

(questionnaire) and qualitative (semi-structured interviews) research tools respectively to the context of the current mixed methods research study.

3.6.2. Validity and Reliability of Research Tools

Over the years there has been much discussion in the literature and at conferences as to how to think about these two contentious terms of *validity* and *reliability* in mixed methods research. Whatever procedure is being used to collect data, it should always be examined critically to assess to what extent it is likely to be reliable and valid (Bell, 2010).

Validity refers to the degree to which a method, a test or a research tool actually measures what it is supposed to measure (Wellington, 2015). The term '*reliability'* is equally contentious. This is a judgement of the extent to which a test, a method or a tool gives consistent results across a range of settings, and if used by a range of researchers. It is linked to the idea of '*replicability'*, i.e. the extent to which a piece of research can be copied or replicated in order to give the same results in a different context with different researchers. Hence, *validity* asks: Do the instruments measure the phenomenon that they are supposed to? *Reliability* asks: If I use the same measure today and repeat it again on the same population shortly thereafter, will I obtain the same results? (Hesse-Biber, 2010). One interesting thing to note in this regard is the relationship between validity and reliability, especially within a sequential explanatory mixed methods study. Several steps were taken in order consideration to minimise threats to the validity and reliability of the study. Thus, these two contentious terms (Wellington, 2015) of *validity* and *reliability* of the research form an important element of the research design and are discussed below in relation to the research tools used in the current research.

- **Validity and Reliability of the Questionnaire**

To confirm the instrument's validity, i.e., that it was accurate and measured what it was supposed to measure, two procedures were followed. First, the constructs and the measures applied in the study had been validated previously and were well supported in the literature. Second, a pre-test was undertaken with subject-matter experts (one academic at the University of Algiers) to ensure content validity. Hence, in quantitative

research, investigators choose instruments, modify existing ones, or develop original ones to measure the variables of interest. If they wish to choose an existing instrument, researchers need to identify one for which there is evidence that past use of that instrument resulted in scores showing high *validity* and *reliability* (Creswell & Clark, 2018).

To confirm its reliability, the questionnaire was next subjected to a pilot study (Hair et al. 2006). As this study concerns the continuous use of ICT in future, the instrument was distributed to EFL teachers at Hassiba Benbouali University, 33 of whom responded by completing the questionnaire. Cronbach's alpha for each construct was then computed. A scale is generally considered reliable if the value of Cronbach's alpha for each construct is equal to or greater than 0.70(Taber, 2018) .As found in the current study, all alpha values exceeded this criterion. Hence, the reliability of an instrument is its ability to give nearly identical results in repeated measurements under identical conditions. In other words, *reliability* is about reproducibility (Blunch, 2013). Thus, conducting a quantitative study first can provide options for enhancing the *validity* and *reliability* of qualitative findings, as well as for exploring contradictory results found between the quantitative and qualitative studies (Hesse-Biber, 2010).

To check and ensure the internal reliability of the questionnaires, Cronbach's alpha tests were carried out using SPSS (v.26). The Cronbach's alpha values for the internal consistency of the scale and the items ranged from acceptable to good. According to Hair et al. (2014), Cronbach's alpha is a reliability measurement ranging from 0 to 1, and the lower limit of acceptability is from .60 to .70. In general, the informants reported positive attitudes on the statements that belong to different constructs on the use of Information Technology. Overall, the results showed that the questionnaire was reliable and that the scale had good internal consistency (see Table 3.4).

Table 3.4: Summary of Reliability Statistics of Constructs

Construct	Items	Cronbach's Alpha	Cronbach's Alpha of Whole Scale	Composite reliability
1. Performance Expectancy	4	.924		.961
2. Effort Expectancy	4	.910		.953
3. Social Influence	5	.739		.859
4. Facilitating Conditions	5	.700	0.817	.836
5. Attitude toward using technology	6	.840		.916
6. Behavioural Intention	4	.880		.938
7. Use Behaviour	4	.728		.853
Total	32			

The Cronbach's alpha coefficient values of the seven dimensions were. 924,. 910,. 739,. 700,.840,.880 and. 728, while the Cronbach's alpha coefficient value of the whole scale is 0.817 (as shown in Table 3.4), indicating that the scale had good reliability.

- **Validity and Reliability of the Interviews**

Validity and *reliability* are concepts that are commonly used in quantitative research, but they can also be applied to qualitative research. Qualitative research is inherently interpretive (Hanson et al., 2019). Hence, *validity* and *reliability* need to be redefined to some extent if they are to be employed in an interpretivist setting, because they are entrenched in a positivist perspective. As these concepts are frequently used in quantitative research, they can be used to explore what validity and reliability mean in the qualitative research paradigm (Golafshani, 2003).

It is critical in this study to ensure that the informants will recognise the researcher's descriptions and interpretations of EFL teachers' views and experiences at Hassiba Benbouali University of Chlef. This will lend credibility to the findings and correlate to what is known as '*internal validity*' in quantitative investigations. However, Hesse-Biber (2010) notes that qualitative approaches promote listening between researchers and the researched in order to get at 'deeper, more genuine expressions of beliefs and values to foster a more accurate description of views held' and gather a more complex understanding of social life.

Additionally, qualitative approaches, because of their exploratory and theory-generating nature, tend to be oriented toward discovery of new phenomena and ways of

understanding. Qualitative approaches and methods in the second phase of the current study are useful for getting at the lived experiences of the individual, by asking such questions as, '***To what extent, if any, are EFL teachers' lived experiences influenced by psychological factors in terms of their use of ICT in teaching practices?***' Thus, qualitative methods are chosen in situations where a detailed understanding of a process or experience is wanted, where more information is required to identify the boundaries or characteristics of the issue being investigated, or where the only information available is in non-numeric (e.g., text or visual) form (Pat Bazeley & Jackson, 2013). Typically, such investigations necessitate gathering intensive and/or extensive information from a purposively derived sample.

It is also essential for the researcher to look neutral, but interested in what the teachers had to say, without encouraging any specific answers or showing any particular reactions. As with the survey questionnaire, teachers may desire to look more skilled at using Information Technology than they are, or conversely, exaggerate challenges, as the interview may provide them with an opportunity to complain. Conversely, they may refuse to provide some details, resulting in an incomplete or misleading description of their circumstance. As a result, it was important to keep an eye on any interviewee bias, and neutral questions like, '*Can you tell me a little more about that?*' were used to elicit more information. The replying informants might also be reminded that the interview was confidential and that their information would be kept anonymous.

Within the mixed methods field, discussions of validity and reliability often take the form of a *methods-centric discussion* regarding the mismatch of mixed methods design elements (Hesse-Biber, 2010). The specific data collection and analysis procedures that we use in the present study are elaborated in the subsequent sections beginning with the first quantitative phase.

3.7. Data Collection and Analysis

In the current research, quantitative and qualitative data were collected sequentially. Both data sets were then analysed separately and mixed at the interpretation stage, using the research questions as a guiding framework. The questionnaire data was entered into the Statistical Package for the Social Sciences Software (SPSS) [7]version 26 and analysed to obtain descriptive statistics (percentages, mean score-M, and standard deviation-SD) and correlational statistics (Spearman).Multiple regression analysis was also conducted to identify the extent to which each independent variable impacts on Algerian Higher Education EFL teachers 'attitude toward using technology, intention to use and actual use of Information Technologies, thus making it easier to examine the relationships among the variables via Spearman and to differentiate the influence of moderator variables across independent and dependent variables. Meanwhile, data from the interviews were coded into themes by using the software of MAXQDA[8]. Quantitative and qualitative data were then mixed for interpretation to show an insight of the EFL teachers' ICT use in their classroom teaching practices at Hassiba Benbouali University of Chlef, Algeria.

A detailed discussion of the data collection and analysis procedures methods follows. For readers' convenience, the data collection and analysis are presented separately while in practice, they are interconnected.

3.7.1. Data Collection Methods

The data-gathering methods employed in this mixed-methods study were:

- a *quantitative questionnaire* consisting of seven constructs and was administered online via Google Form Application to all 45 EFL teachers from

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[7] SPSS is software which was originally created by three Stanford graduate students in the late 1960s. The acronym 'SPSS' initially stood for 'Statistical Package for the Social Sciences.' As SPSS expanded their package to address the physical sciences and business markets, the name changed to 'Statistical Product and Service Solutions.' In 2009 IBM purchased SPSS and the name morphed to 'IBM SPSS Statistics."(George & Mallery, 2020).

[8] MAXQDA is a software package for the analysis of qualitative and mixed data that belongs to the family of CAQDAS, the acronym for "Computer Assisted Qualitative Data Analysis Software." (Kuckartz & Rädiker, 2019),which since its beginnings at the end of the 1980s has focused on the support of mixed methods research (Kuckartz & Rädiker, 2019, 2021).

the English Department through the use of emails with 33 completed
questionnaires being returned, and

- *qualitative semi-structured interviews* with six EFL teachers from the
aforementioned Department,

The theoretical framework of the present study informed the current research and its
exploratory nature and mixed methodological approach. The mixed methods
methodology of this research aimed to explore what and how *psychological* and *socio-demographic* factors might influence teachers' acceptance and use of Educational
Technology. In order to explore these factors, a number of questions were asked to
teachers about what they know, believe and do about these factors. Such questions were
investigated through survey questionnaires and semi-structured interviews. Table 3.5
below shows the research questions and the methods used to answer these questions.

Table 3.5: Research Questions and Methods

Research questions	Method used to help answer the question
RQ 1: What are the *psychological factors* that influence EFL teachers' acceptance and use of ICT in teaching practices at Hassiba Benbouali University of Chlef (HBUC)?	Survey Questionnire + Semi-structure interviews
• *To what extent (if any) do Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions affect teachers' attitudes toward using technology at HBUC?*	Semi-structure interviews
• *To what extent (if any) do Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Attitudes Toward Using Technology (ATUT) influence EFL teachers' behavioural intention to use ICT in the AHEIs?*	Semi-structure interviews
• *To what extent (if any) is behavioural intention (BI) a predictor of use behaviour (UB) of ICT at HEIs?*	Semi-structure interviews
RQ 2: To what extent (if any), do teachers' *socio-demographic variables* (age, gender and teaching experience) moderate the	Survey Questionnire

effects of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes Toward Using Technology on teachers' intention to use ICT?

RQ 3: How can the revised UTAUT model, as the theoretical framework of the current study, be used to better understand what Algerian Higher Education teachers perceive they need to effectively use ICT?

Survey Questionnire+Semi-structure interviews

Questionnaires and interviews are two of the common methods that can be used in a mixed methods study to collect data and answer research questions. Thus, the survey questionnaires and semi-structured interviews seemed to fit the current approach because they could provide information about the teachers' views and experiences in regard to the *psychological* and *socio-demographic factors* that can influence their use of ICT. Further details of each of these data collection measures are described below.

3.7.1.1. The Structured Questionnaire

As the first phase of this study sought to gain an understanding of the factors that currently influence teachers' acceptance and use of ICT in teaching practices, an online survey questionnaire was deemed appropriate. In this study, the questionnaire is selected as the research instrument for the first phase of data collection for the following reasons: (1) quantifiable information is required, (2) questionnaires can collect the informants' opinions in a structured way and (3) the literature reveals that key studies using the UTAUT model have used survey questionnaires, yielding a valuable resource from which this study can draw. For instance, a meta-analysis of 174 studies using the UTAUT model showed that 155 of them used survey instruments as their method of collecting data (Williams, Rana & Dwivedi, 2015). Furthermore, the questionnaire instrument seeks to gain data about teachers' current experiences in the Algerian Higher Education Institutions in terms of the provision and use of Information and Communication Technologies. Hence, the questionnaire used in this study was developed from similar instruments in past surveys of ICT acceptance and use in the field of Education (Oye et al., 2014; Mtebe et al., 2016;Garone et al., 2019; Yakubu et al., 2019; Kim & Lee, 2020; Khan & Qudrat-Ullah, 2021)(Khan & Qudrat-ullah, 2021)

and was tested in a pilot study with four EFL teachers in the Department of English. The pilot study results permitted an analysis of the clarity and discriminatory ability of individual questions and an assessment of respondents' evaluation of overall questionnaire design (see Subsection 3.7.1 for full detail).

Given the geographical dispersion of the teachers, the survey questionnaire was conducted online and contained the questions included in Appendix B. Random sampling was used in the survey to collect data in a timeframe between June 8th and July 9th, 2021. E-mail addresses of in-service teachers at the Department of English were obtained from the official website of Moodle at Hassiba Benbouali University of Chlef (See 'Teaching and Administrative Staff,' 2021) and the link of the questionnaire was e-mailed to a 45 EFL teachers. The request to take part in the survey was re-sent three times to the same list of teachers in order to remind them, as the questionnaire was anonymous. The online survey took about 10 min to answer. After four weeks, the data collection process ended. Overall, 35 teachers completed the online questionnaire, of which there were 34 completed responses, and one incomplete responses. While analyzing the complete responses, only one incomplete and non-valid response to the survey was deleted, leaving 33 usable responses for a final analysis. Thus, the rate of valid responses was 73.3%.

Using an online questionnaire is an easy way to gather data if the target population is spread over a wide area or far away from the researcher. Communicating online can be more reliable than by in print form, especially with the unusual circumstances of the spread of COVID-19 in the world in general and in Algeria in particular. As data are handled electronically via the use of Google Form and stored in a database, there is a smaller likelihood of errors. Informants may find it easier to navigate through an online questionnaire that can automatically direct them to the next question; this way reduces errors and may also increase the response rate (Zalah, 2018). It also saves time, as the data do not need to be entered by the researcher manually. Hence, the online survey is the preferred method of collecting quantitative data from the respondents so as to increase response rates, reduce costs and minimise errors due to data handling (Nasiru Yakubu & Dasuki, 2019).

The online system used to distribute the questionnaire online is Google Form. This is selected because it is a global leader as a system of data collection and analysis for researchers. This survey tool has a number of advantages: It is easy for informants to use, and the results can be instantly and easily accessed by the researcher. It permits the inclusion of different types of questions to be included, which provides great flexibility. Scoring the data, which is essential for quantitative analysis, is also easy with Google Form, as there is an option for automatically scoring data as it is entered by informants. The data can be exported directly to SPSS, CSV, PDF and Excel; this also means that data do not have to be 'cleaned' before processing to identify questions not answered, as Google Form offers an option that disallows informants from missing questions.

According to the literature review and the specific purpose of this research, a self-administered questionnaire was developed to collect the empirical data for this study.In the context of this study, the questionnaire design was based on studies conducted by Venkatesh et al. (2003), who used the UTAUT model to explore technology acceptance; it was also based on other empirical studies on teachers' acceptance and use of Information Technologies, such as Garone et al. (2019), Hu, Laxman & Lee (2020), Khan & Qudrat-ullah (2021), Li(2021), Morchid (2019) and Sultana (2020); (see also Literature Review Chapter 1).

The questionnaire is designed cross-sectionally (snapshot study) rather than longitudinally in this research; this means that current behaviours and attitudes are recorded. By cross-sectional, the study has the advantage of being quicker and cheaper than a longitudinal one and is interested in understanding the users' adoption and use of ICT at a point in time, not necessarily how those variables change over time (Janssen & Cresswell, 2005; Obienu & Amadin, 2021). The overall design of the research is cross-sectional but embedded in different levels of triangulation (repeated cross-sectional studies, with different samples and aspects of the phenomenon). Thus, cross-sectional studies only provide a momentary glimpse of a phenomenon (Obienu & Amadin, 2021).

A number of caveats were incorporated in the design of the questionnaire. For example, leading questions that encourage a particular response were to be avoided, as was the case of using language that was too complex or technical for the informants. Double negatives were avoided in questions and statements, and the use of open-ended

questions was minimised. It was important to consider the ordering of the questions, and these progressed logically. Close attention was paid to how items in the constructs of the questionnaire were worded, and the informants were given explicit instructions at the beginning of each construct. The questionnaire was designed after reviewing a number of prior surveys in the field of Education. Some questions were adapted to fit the educational context in Algeria, while others were generated from scratch. When developing the questions, we took into account what we had learned from earlier fieldwork and from informal interviews with Algerian teachers of Higher Education undertaken in the preliminary phase.

The online questionnaire was designed and divided into two sections (See Appendix B). The first section involved socio-demographic variables presented on a nominal scale. The questionnaire collected basic information about informants' characteristics, including age, gender, technology use and teaching experience. In the second section, 36 items were used to measure the seven psychological constructs presented in the research model (Figure 1.12 in Section 1.4). These seven constructs were categorised as (1) *exogenous variables* (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SE), Facilitating Conditions (FC), and (2) *endogenous variables* – i.e. Attitude Toward Using Technology (ATUT), Behavioural Intention – BI – , and User Behaviour – UB – . Each construct is measured by multiple items. To quantify the constructs, a 5-point Likert scale was adopted to score questionnaire responses. The Likert scale consisted of five answer options ranging from '*strongly disagree'* (mapped to number 1) to '*strongly agree'* (mapped to number 5).

The factors explored in Section B of Phase One survey are detailed below, along with the sources of the questions. A brief rationale for the inclusion of each factor is also given. Further details on the theories included in the UTAUT model can be found in Chapter 1.

1. Performance Expectancy

An accumulated body of research pointed out that *Performance Expectancy (PE)* is the most significant forecaster of behavioural intention and technology use because it indicates an individual's perception that he or she can improve in terms of job performance by using the technology in question. The literature in general suggests that

this construct is significant (e.g., Alotaibi & Wald, 2014; Dwivedi et al., 2019; Kim & Lee, 2020). Moreover, many researchers have demonstrated that the relationship between PE and the intention to use the technology or the system is almost always positive (Ouedraogo,2017) and PE is significant at all points of measurement for mandatory and voluntary settings (Venkatesh et al., 2003; Zalah, 2018).

Teachers are frequently expected to use technology tools as part of their teaching and other responsibilities (Teo, 2011). As a result, a positive link between these criteria implies that if Algerian Higher Education teachers believe that technology tools help them complete daily teaching tasks more efficiently and quickly, they are more likely to desire to use them.

PE was evaluated in the survey using questions proposed by Venkatesh et al. (2003) and other researchers in the Information Systems and Information Technology areas. The questions were either used as they were in the original UTAUT model or adapted to suit the Algerian Higher Education context in order to determine the extent to which it influences the Behavioural Intention to accept and use Information and Communication Technology. The questions also sought to address the following research question: ***To what extent does Performance Expectancy influence teachers' Behavioural Intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?*** (See Table 3.6 below).

Table 3.6 Survey Questions on Performance Expectancy

Items	Questions	Source
PE1	I find technologies useful for teaching and learning.	(Mtebe et al., 2016)
PE2	Using ICT enables me to accomplish tasks more quickly.	(Oye et al., 2014)
PE3	Using technology improves my performance.	(Teo, 2011)
PE4	Using technology increases my productivity.	(Teo, 2011)

The informants were given clear definitions of the factors being tested as a heading to the relevant construct, as follows:

These questions seek to determine how far do Information Technologies are currently helping EFL teachers to do their job.

2. *Effort Expectancy*

As the second independent variable, *Effort Expectancy (EE)* is defined as the degree of ease associated with using a system and represents the linkage to the intention to accept and use the technology. In the early stages of adoption, individuals who utilise a system may perceive that there are several problems concerning the use of the technology. However, when the individuals become accustomed to using the technology, this factor becomes more important in determining use behaviour. The literature suggests that this variable is important in explaining technology acceptance and use in an educational context (Pynoo et al., 2011;Bellaaj, Zekri & Albugami, 2015; Tosuntaş, Karadağ & Orhan, 2015).

In the survey of the current study, questions suggested by Venkatesh et al. (2003) and other researchers were used to test EE. The questions were either used exactly as they were in the original UTAUT Model or they were adjusted to match the context of Algerian Higher Education in order to determine the extent to which it influenced the Behavioural Intention to accept and use Information Technology (See Table 3.7 below).

Table 3.7 Survey Questions on Effort Expectancy

Items	Questions	Source
EE1	Learning to use ICT is easy for me.	(Oye et al., 2014) (Teo, 2011)
EE2	I find ICT easy to use.	(Oye et al., 2014)
EE3	I find using ICT in teaching enables more flexible interaction.	(Oye et al., 2014)
EE4	It is easy for me to become skillful at using ICT.	(J. Kim & Lee, 2020)

The informants were given a clear definition of the factor being tested as a heading to the relevant construct, as follows:

These questions seek to determine how easy EFL teachers currently find it to use Information and Communication Technologies in their teaching practices.

3. *Social Influence*

Social influence (SI) is the third independent variable, defined as the extent to which teachers perceive that *significant individuals* believe they are supposed to use the system (Zalah, 2018). In this study, *significant individuals* include the administrators (e.g. Dean of the Faculty, Head of the Department of English), teachers' colleagues and students. SI takes into consideration the subjective norms and self-image of teachers as well as how agents of socialisation and social control affect perceptions and behaviours (Bere, 2014; Khechine et al., 2014; Venkatesh et al., 2003). According to previous models of technology acceptance, including the UTAUT model, this factor has a positive relationship with the Behavioural Intention to use technology. Thus, teachers' perceptions of the attitudes of *significant individuals* in this matter need to be taken into account (Adegbite & Downe, 2005; Oye, 2012; Khechine et al., 2014).

SI was tested in the survey with questions suggested by Venkatesh et al. (2003) and other researchers. The questions were included in the original UTAUT Model or modified to fit the Algerian Higher Education context to determine the extent to which SI influenced the Behavioural Intention to accept and use Information and Communication Technologies. (See Table 3.8 below). Furthermore, the questions sought to address the following research question: ***To what extent does Social Influence teachers' Behavioural Intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?***

Table 3.8 Survey Questions on Social Influence

Items	Questions	Source
SI1	My colleagues who influence my behaviour think that I should use technology more innovatively.	(Garone et al., 2019)
SI2	Colleagues, who are important to me, think that I should use technology.	(Teo et al., 2019)
SI3	People whose opinions I value prefer that I use ICT.	(Teo et al., 2019)
SI4	My colleagues have helped me to use ICT.	(Kim & Lee, 2020)
SI5	My students think I should use ICTs.	(Kim & Lee, 2020)

The informants were given a clear definition of the factors being tested as a heading to the relevant Construct of Social Influence, as follows:

> **These questions seek to determine what EFL teachers currently think other people's ideas are about their use of Information Technologies.**

4.Facilitating Conditions

Facilitating conditions (FC) are external environmental factors that are likely to exert an influence on individuals' decision or desire to perform a task. FC is the fourth independent variable, and it is a perceived barrier or enabler within an environment. It is also hypothesised to influence people's perceptions of how difficult or easy is to perform a task (Venkatesh et al., 2003). In the context of Universities, various factors are identified that would probably work either as barriers or as facilitators of user acceptance of technology. FC includes technical support, adequate technology equipment and software, support from colleagues and university administration.

In the survey, FC was investigated using questions proposed by Venkatesh et al. (2003) as well as questions devised by the researcher. The questions were altered from the original UTAUT Model to fit the Algerian Higher Education environment, and they were designed to examine the extent to which this factor influenced the Behavioural Intention to accept and use Information Technology (See Table 3.9 below). Moreover, the questions sought to address the following research question: ***To what extent do Facilitating Conditions influence teachers' Behavioural Intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?***

Table 3.9 Survey Questions on Facilitating Conditions

Items	Questions	Source
FC1	Classrooms at my University are well equipped with ICTs.	Kim & Lee (2020)
FC2	I have the resources necessary to use ICT (e.g., Laptop, Internet etc.).	Oye et al.(2014)
FC3	I have the knowledge necessary to use ICTs.	Oye et al.(2014)
FC4	When I encounter difficulties in using ICT in classroom, I know where to seek assistance.	Kim & Lee (2020)
FC5	Training and manuals for ICTs are available.	Kim & Lee (2020)

The informants were given a clear definition of the factor being tested as a heading to the relevant section, as follows:

These questions seek to determine what EFL teachers think about the

current

facilities that support their use of Information and Communication Technologies.

5. Attitudes towards Using Technology

Teachers' attitudes and perceptions toward using technology as part of their pedagogy are thought to be a major determinant of how well-new technologies are integrated in educational settings. Any technology-integration initiatives in Higher Education rely heavily on the support and attitudes of teachers. As long as teachers have a negative attitude towards technology, it is unlikely they will adopt it. The literature suggests that Performance Expectancy (PE) and Effort Expectancy (EE) are the major factors influencing the attitudes of individuals towards using technology. As a result, it is critical to include the attitudes of the Algerian EFL teachers at Hassiba Benbouali University of Chlef at the time of the conduct of the survey.

Teachers' attitudes toward using Information Technologies were tested in the survey through the questions given below, which cover all of the elements described above. The questions were used to estimate the original UTAUT or adapted to fit the Algerian Higher Education context. The questions aimed to quantify the extent to which this factor influenced the Behavioural Intention to accept and use ICT (See Table 3.10 below). Moreover, the questions sought to address the following research question:

To what extent does Attitudes Towards Using Technology influence teachers' Behavioural Intentions to use ICT in the Algerian Higher Education Institutions (HEIs)?

Table 3.10 Survey Questions on Teacher Attitude towards Using Technology

Items	Questions	Source
ATT1	The use of ICT at our University is a good idea.	(G. K. W. Wong, 2016)
ATT2	ICT makes teaching more interesting.	(Garone et al., 2019; Jairak et al., 2009)
ATT3	Working with ICT is fun.	(Garone et al., 2019)
ATT4	I enjoy using ICT in teaching.	(Garone et al., 2019)
ATT5	ICT makes learning more interesting for the students.	(Garone et al., 2019)
ATT6	Overall, I have positive feelings towards the use of ICT in teaching.	(Teo et al., 2019)

6.Behavioural Intention

Behavioural Intention (BI) has been identified in the literature as one of the factors influencing the use of technology in addition to the indirect and direct influences of 'Performed Expectancy', called perceived usefulness, 'Effort Expectancy' called perceived ease of use. It is defined as the subjective probability that users will carry out the behaviour in question. Most of the studies conducted on acceptance of technology have considered end users' Behavioural Intention to use technology as the dependent variable. A number of independent variables are used to determine their direct and indirect effect of intention to use, which includes: Performed Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude Towards Using Technology.

In the context of the current research, Behavioural Intention was tested in the survey to determine whether and how it influenced actual use of Information Technologies.

The questions were in the original UTAUT or modified to fit the Algerian Higher Education context (See Table 3.11 below). Moreover, they sought to address the following research question: ***To what extent does Behavioural Intention influence teachers' actual use of ICT in the Algerian Higher Education Institutions (HEIs)?***

Table 3.11 Survey Questions on Behavioural Intention

Items	Questions	Source
BI1	I intend to continue to use ICT in the future.	(Teo, 2011; Zalah, 2018)
BI2	I expect that I would use technology in the future.	(Teo, 2011)
BI3	I plan to use technology in the future.	(Teo, 2011)
BI4	I am willing to encourage other people to use ICT.	(Yakubu & Kah, 2020)

7.Actual Use of Information Technologies (Use Behaviour)

Use Behaviour or *Actual Use of ICT* is simply the adoption and use of Information and Communication Technology (ICT) in EFL classroom teaching practices. This construct (*Use Behaviour*) is the 'dependent variable' of this study that has been adopted by numerous technology acceptance models/theories such as Technology Acceptance Model (TAM) and the Universal Theory of Acceptance and Use of Technology (UTAUT). The existing literature provides some insight into the factors that influence usage behaviour of ICT both directly and indirectly. According to the UTAUT, four

constructs are deemed to be direct determinants of user acceptance and usage behaviour: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. The modified model of the current research also provides the direct and mediating effect of attitudes onto use behaviour. Thus, the *actual usage of ICT* may be influenced by teachers' *Behavioural Intentions*, as well as their *Attitudes towards the Use of the Technology.*

Actual Use of Information Technologies was tested in the current study via the questions given below, which were taken from the original UTAUT Model or adapted to suit the Algerian Higher Education context (See Table 3.12 below).

Table 3.12 Survey Questions on Actual Usage of ICT (Use Behaviour)

Items	Questions	Source
AU1	I use computer for my class preparation.	(Kim & Lee, 2020)
AU2	I use computer during my classroom instruction (teaching).	(Kim & Lee, 2020)
AU3	I use other device (e.g., mobile, tablet PC) for my class preparation	(Kim & Lee, 2020)
AU4	I use other device (e.g., mobile, tablet PC) during my classroom instruction.	(Kim & Lee, 2020)

As with all the questions in Phase One of the study, the overall aim is to explore to what extent the various psychological factors influence teachers' acceptance and use ICT in their classroom teaching practices, and to highlight areas to be covered by Phase Two which addresses why this happens, in other words, to find the underlying reasons for the influence of each factor.

3.7.1.2. Semi-Structured Interviews

Semi-structured interviews were the main tools used for collecting qualitative data in the second phase of this research. As stated by Kisanga (2015) ,interview is arguably a flexible tool for data collection that enables multi-sensory channels (verbal, non-verbal, spoken and heard) to be used. As stressed also by many researchers (e.g., Kaplan and Maxwell (1994), the primary goal of interview is to elicit the respondent's views and lived experiences in his or her own words rather than to collect data that are simply a choice among pre-established response categories. The most successful interviews are

those in which participants speak about personal experiences, narrating events from the near and distant past, even digressing from the interviewer's questions or topics to initiate talks about their interests and feelings. Interviews are flexible enough to favour adaptation to each context, organisation and also to pursue unexpected paths and cues suggested by the theoretical sensitivity developed by the researcher throughout the research process. Interviews have long been used in social science research to learn about attitudes, beliefs, and experiences of individuals. Semi structured interviews often give excellent insights into what questionnaire respondents may mean. Interviews may be categorised in different ways, such as being structured or standardised, semi-structured or focused, and unstructured or unstandardised (Liamputtong, 2019). In this regard, the semi-structured interview was used in Phase Two of the current exploratory sequential mixed methods study.

The semi-structured interview was planned to cover both the themes discussed in the literature as well as the findings of the first phase, as teachers' responses to the survey questions revealed areas that needed more investigation. To put it differently, the results of the survey data were analysed in order to generate questions for the interview. As a result, the survey yielded potential interviewees for Phase Two, these interviewees were asked to clarify and elaborate on their responses to the Phase One survey.

Grounded theory aims to create and develop a theory based on the data collected. For a variety of reasons, the grounded theory method is not appropriate for our study. Because the major concept of grounded theory is to generate or create a theory, in this study we are testing hypotheses rather than generating or building a new theory from the data. Furthermore, we are testing and validating a well-known UTAUT model that has been tested and duplicated in other regions of the world and across cultures but has not previously been evaluated in the Algerian Higher Education environment. As a result, our hypotheses already exist and do not need to be formed or generated from the data.

In the current study, seven stages are used in Phase Two of interview investigation. The first of these is thematising, when the purpose of conducting the semi-structured interviews was established, i.e. to address the research question: '***How may the UTAUT model be used to better understand what Algerian Higher Education teachers perceive***

they need to effectively use Information and Communication Technology (ICT)?' This was done by investigating further any unexpected outcomes from the survey and exploring the relationship between the factors in the proposed modified UTAUT model and the acceptance and use of ICT by interviewees more deeply, allowing the model to be further refined if necessary. Designing the interview schedule was stage two, where the interview schedule and all of the planning and techniques needed to conduct the interviews were prepared. Consequently, at the design stage, we required a clear plan for all the subsequent stages, which are shown below in Figure 3.9.
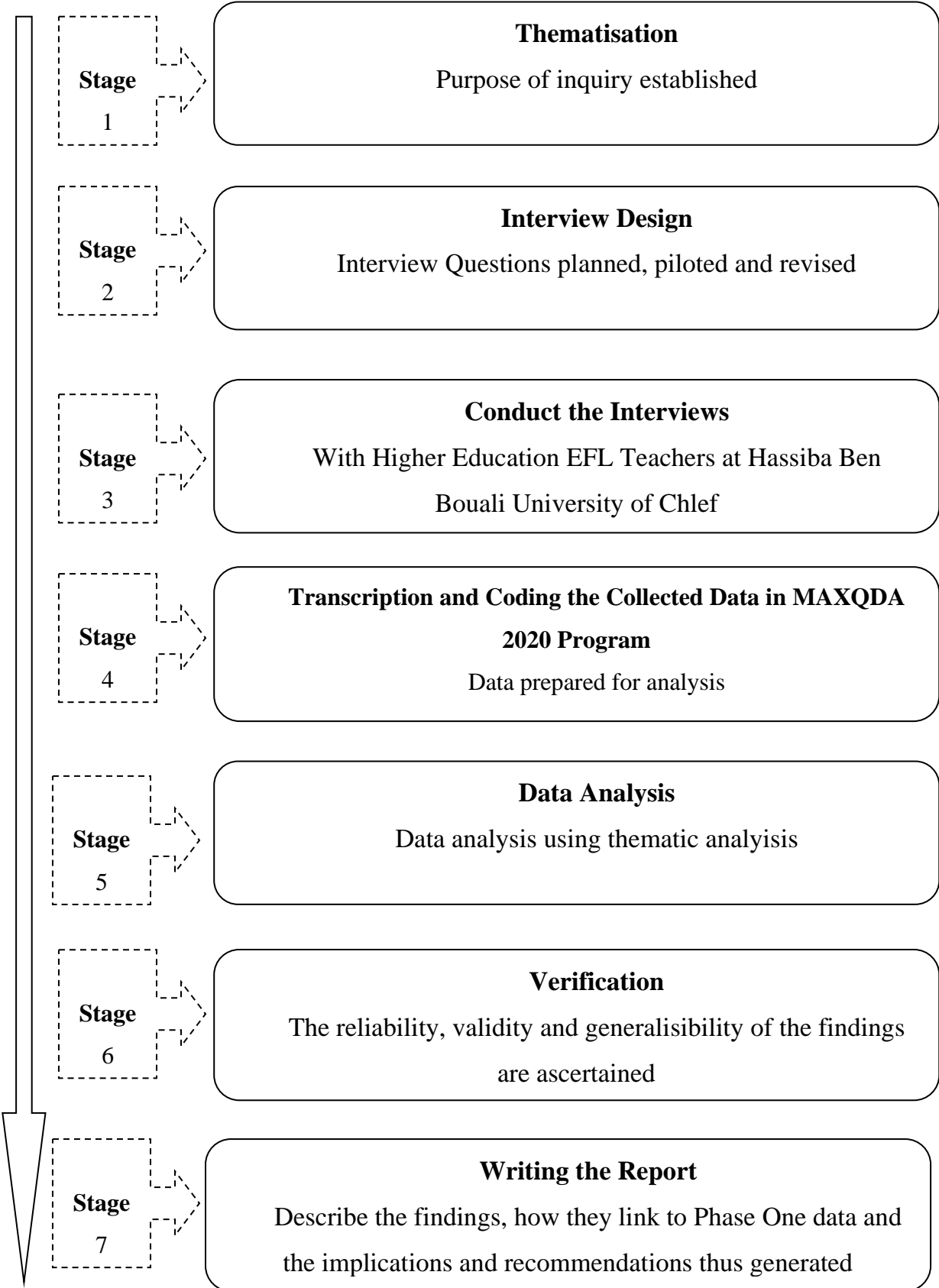
Figure 3. 9 The Seven Stages of an Interview Investigation (Adapted from Kvale, 2007)

Qualitative data collection commenced after the survey results were analysed. As mentioned earlier in Section 3.5.3, a purposeful sample of six teachers was selected from informants who expressed interest in participating in follow-up interviews. They were interviewed individually to ensure an in-depth exploration and explanation about the similarities and differences between the teachers' responses in regard to the factors that might influence their use of ICT. The qualitative data collection was used to support and further understand the findings from the quantitative component of the study. All interviews lasted for about 10 to 20 minutes. The interviews were audio tape recorded and later transcribed.

Informants for the qualitative component of the study volunteered at the end of the quantitative study to be contacted later about participating in a semi-structured interview. Informants were purposefully sampled because of the time required to participate with unexpected crisis of COVID-19 and the fact that contact information was needed. Teachers also were not forced to identify themselves in the study; so, purposefully sampling could be conducted. There were 14 teachers who volunteered and only six of them participated in semi-structured interviews. As mentioned earlier, the number of informants was based on Stake's (2006) recommendation of sampling 4 to 10 informants. The majority of the informants were male (n = 4, 66.66%) and there were two females (n= 2, 33.34%) who participated.

The interview schedule (see Appendix E) was based on the variable constructs of Venkatesh et al (2003)'s original UTAUT model, a guide to predicting teachers' Behavioural Intention and Use of Information Technology, as well as an analysis of perceived barriers. Hence, interview schedule was created considering the constructs employed in the questionnaire in the first phase of the current study.One particular question was written for each construct and two or more general questions regarding the possible factors influencing teachers' use of ICT in their teaching practices were asked in the interviews. As explained earlier, the questions prepared for the interviews were checked by two language teachers. Based on the feedback provided by the EFL teachers, some of the questions were reformulated.

Threfore, the interview schedule was broken down into three sections. Section one focused on gathering demographic information about the participants as well as insight

into the teachers' use of ICTs for teaching in general in order to respond to research question : *What is the experience of Algerian EFL teachers with Information Technology?* It began with simple questions to ease the respondents into the interview: Do you use ICTs, such as a smartphone or PC? If so, in what ways do you use them, and why? If not, why not?

Section two focused on gaining insight into the use and perceptions of ICT based on the findings from the component in the theoretical framework (UTAUT) of the quantitative phase in order to reply to research question 1: ***What are the factors that are associated to the Algerian University EFL teachers' acceptance and use of Information and Communication Technology (ICT) in their practices?*** The key interview and follow-up questions involved were as follows:

- Performance Expectancy (PE)
- Effort Expectancy (EE)
- Social Influence (SI)
- Facilitating Conditions (FC)
- Attitude toward Using Technology (ATUT)
- Behavioural Intention: (BI) Do you intend to use ICT in your teaching? Why?
- Use behaviour: (UB)

The third section focused on the obstacles that prevent teachers from using ICT into their classroom teaching practices. We asked the participants a set of questions in order to identify hurdles hindering the adoption of ICT in the EFL classrooms such as: ***Is there any factor in your experience at the level of this University that you may think influences your teaching that we have not yet had a chance to discuss?***

This study sought to explore the perspectives of informants towards their use of ICT. Therefore, the interview questions focused on what informants *know*, *what they do*, and *what they feel* or *think*. In other words, interviews were conducted to find out information about facts, behaviours, beliefs, attitudes and the lived experiences of the interviewees. Interviews are very widely used in social research, and there are many different kinds. For the purpose of this research, semi-structured interviews were employed to explore issues that affect teachers' usage of ICT which have not been

reported in the literature, especially in the Algerian Higher Education context. At the same time, questions were arranged around an important theme to narrow the focus of interview questions. For example, when we asked teachers about the training as a kind of professional development, some of them reported the issues of classroom observation between teachers as another type of professional development. Moreover, we sought to focus on several specific ideas while giving opportunities to the participants to explain themselves and add unexpected ideas.

Besides, the conduct of the semi-structured interview in the second phase of the current study gave the interviewee more freedom than in a structured interview but, at the same time, it allowed the interviewer to get more control over the conversation with a semi-structured interview than with an unstructured one. In a semi-structured interview, as the questions are predetermined, the interviewer has the opportunity to change the order of questions and explain questions based upon what seems most suitable. Hence, the main role of the interviewer is to ensure the successful engagement with informants to gain rich data (Alnosiaan, 2018).

Thus, we met every teacher and engaged in a conversation before agreeing on a proper time for the interview. Each interview was recorded, and informants were asked for in-depth details. Then, as soon as possible, after the interview, the recording was transcribed together with notes on the unspoken behaviour that occurred during the interview. Interviews were conducted with six teachers from the Department of English at Hassiba Benbouali University of Chlef and lasted between ten to twenty minutes.

For qualitative data collection, forms for recording the information need to be developed. If interview data are collected, then an interview protocol is needed that includes the major open-ended questions to be asked during an interview and that provides space for recording both information gathered during the interview and essential data about the time, day, and place of the interview. In many cases, the researcher makes an audio recording of the qualitative interviews and later transcribes them, and the protocol becomes a backup system for recording information. The interview protocol is pilot tested on one informant, purposefully selected from those who have completed the survey in the first phase of the study. As a result, the order of the protocol questions is revised slightly and additional probing questions are developed

and embedded. Having an interview protocol helps keep the researcher organised, and it provides a record of information in the event that the recording devices do not work.

In general, it is important to know the general procedures of collecting data in qualitative and quantitative research because mixed methods builds on these procedures (see Creswell & Clark, 2018 for a thorough analysis of general guidelines for collecting both forms of data in mixed methods research). Hence, a mixed methods study calls for complete and rigorous qualitative and quantitative research methods, which includes the process of collecting data. In designing a sequential mixed methods study, researchers are highly recommended to advance a quantitative strand that incorporates rigorous quantitative data collection procedures and then a qualitative strand that includes rigorous qualitative data collection procedures (Creswell & Clark, 2018; Creswell & Creswell, 2018). Therefore, it is beneficial to have a systematic road map for gathering relevant and current data to answer research questions and hypotheses for our study (Faryadi, 2019). Quantitative and qualitative analytical procedures are discussed in the next section.

3.7.2. Data Analysis Procedures

A variety of procedures were used for the analysis of data gathered in this explanatory sequential mixed research study. Quantitative and qualitative analyses were used to analyse data from completed questionnaires and semi-structured interviews, respectively. The questionnaire data were analysed by using IBM SPSS Software V26. For the demographic questions, Descriptive Statistics were used. The total score for each construct was calculated. Mean scores for each construct were also found by using Descriptive Statistics. On the other flip side, qualitative data collected through interviews were initially transcribed orally and coded in MAXQDA 2020 Program. The codes, categories and themes were identified through constant comparison methods as suggested by Corbin and Strauss (2008).

Mixed methods data analysis is the processes whereby Quan and QUAL data analysis strategies (e.g., statistical and thematic data analytic techniques) are combined, connected, or integrated in research studies (Teddlie & Tashakkori, 2009) which are discussed later in this section. As explained earlier in this chapter, data analysis and

integration occur at more than one point in this explanatory sequential mixed methods design. In this design, we first collect and analyse the quantitative data, connect from the quantitative results to the qualitative phase, collect and analyse the qualitative data, and then use the qualitative results to understand the quantitative results. Hence, the follow-up qualitative phase provides a strong explanation of specific results from the initial quantitative phase. Thus, the procedure for conducting integrative data analysis in the explanatory sequential design occurs in three phases: (1) the analysis of the initial quantitative data, (2) an analysis of the follow-up qualitative data, and (3) an analysis of how the qualitative data helps to explain the quantitative data to answer the mixed methods question (Creswell & Clark, 2018). In this regard, relatively little attention has been paid to the analysis of mixed methods data. However, a number of scholars have been dealing with questions of data analysis in mixed methods research for some time (Kuckartz & Radiker, 2019).

The quantitative and the qualitative databases are analysed separately in this mixed methods approach. Then the researcher combines the two databases in the form of integration called connecting the quantitative results to the qualitative data collection (Creswell & Creswell, 2018). Inferences from both quantitative and qualitative analyses were integrated during interpretation of results and conclusion to capture a complete understanding of research questions and hence provided richer data (Creswell 2014). In properly conducted MM research, investigators go back and forth seamlessly between statistical and thematic analysis (e.g., Onwuegbuzie & Teddlie, 2003). In this section, the way in which quantitative and qualitative data analysis fit into the research process prior to the statistical and thematic analyses – specifically the process of mixed methods research – will be explored. As we will see, the area covered by this thesis does not solely address the question of how to deal with quantitative and qualitative data, since it is also concerned with other aspects of the research process that impinge on data analysis.

3.7.2.1. Quantitative Data Analysis Procedure

To examine the quantitative data in Phase One of the current study, a two-step approach using the analytical software of IBM SPSS. Taking help of the software, the initial data screening, preliminary analysis, and final hypotheses testing are conveniently

done. Hence, the first phase of data cleaning, initial validity, and descriptive statistics are conducted through SPSS.As illustrated by De Muth (2008),the process of statistical analysis involves establishing the research question, formulating a hypothesis, selecting an appropriate test, sampling correctly, collecting data, performing tests, and making decisions.

IBM SPSS (V26) is used to analyse the quantitative data collected from the research sample via the Phase One survey questionnaire. This programme is chosen since it is simple to use, and we learned how to use it quickly. It provides numerous types of statistics that are required when analysing quantitative data, as well as the ability to construct useful tables and graphs for use in reports. One of the most useful aspects of SPSS is the ability to perform regression which involves examining the relationships between a large number of variables.

The methods used to analyse the data are related to the research questions, hypotheses as well as the type of data to be analysed. The data analysis process does not rely solely on the choice of the appropriate program for the analysis process but also on the basic steps that must be carried out at the beginning. In this study, both *descriptive statistics*, which reduce a large amount of data into the numerical, tabular and graphical forms needed for the report and *inferential statistics*, which allow for conclusions to be made about the target population of Algerian Higher Education teachers are required. In order to perform the analysis, we apply different tests such as descriptive statistics test and regression analysis.

Collected data were subjected to descriptive statistical analysis in the Statistical Package for the Social Sciences IBM SPSS (V 26) software. It was done to provide subsidies to adjust and interpret multiple interrelated-dependence relationships within the same model (Hair et al. 2009 as cited in Martins, Quintana & de Gomes, 2020). Thus, measurements such as frequency, averages such as means and modes and dispersion measurements such as standard deviation needed to be taken. Data analysis strategy not only involved choosing the appropriate statistical analysis techniques, but also the initial steps to handle the data such as coding the responses and cleaning the raw data .As the study used the online questionnaire, all variables were defined in the design phase,which allowed easy export of the data to the statistics software.

The second stage of analysis is looking for the missing data, which is a frequently occurring problem in many studies. Data may be missing because of lack of knowledge of an item by the respondent, a data entry mistake or a respondent's refusal to answer certain items (Creswell, 2014). For this reason, we designed the questionnaire to be such that the participant cannot move forward without completing the answer.Lastly, the data had to be assessed for outliers and normality of distribution by means of multiple regression tests which assumed the data was free of such outliers and normal. The standardised scores of the main variables as well as the kurtosis values and skewness of the data distribution were closely looked at by us before the analysis was done.

At the first stage of the current study, the quantitative data helped to answer the first main research question.

What are the psychological factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education?

This question and its three ensuing questions are about teachers' acceptance and use of educational technology and directly address the various factors in the expanded UTAUT model that were felt to be relevant to the context of the Algerian Higher Education. Before starting to answer this question, we must first identify the dependent and independent variables in the research model.Hence, the independent variables in this research (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology) and the dependent variables (Behavioural Intention and Use Behaviour). Because the research question involves more than one independent variable, we used multiple regression analysis, which is one of the most commonly used statistical tools for measuring the relationship between variables.Thus, this question requires multiple regression analysis to identify the extent to which each independent variable impacts on Algeria Higher Education EFL teachers' intention to use and actual use of Educational Technologies. In this way, those factors having the greatest impact can be revealed. IBM SPSS was used to carry out the Correlation Coefficient test to explore how each factor is related with another. The research process in the quantitative survey (Phase One) is shown in Figure. 3.10 below. Qualitative data collection procedures are fully discussed in the next section.

Define goals and objectives

Collection of research materials Idea Development

Literature Review
ICT Acceptance and Use

Formulate Research Model

Formulate Research Questions

Research Methodology

Research Strategy and Methods

Survey Questionnaire Preparation

Develop Survey Instrument from Research Questions, Hypotheses, and Theoretical

Framwork

Validate Survey Instrument
Conduct Pilot and Sample Representing Target Audience

Revise Survey Instrument
Revise Survey Questionnaire using Pilot Feedback

Finalise Survey Instrument
Final Online Survey Questionnaire Template

Distribute an Online Survey Questionnaire to Target Population
Higher Education EFL teachers at the University of Chlef

Export and Input Data in IBM SPSS and Amos V26

Data Analysis

Answer the relevant Research Questions and Hypotheses

Research Implications
Determine areas to be further explored in Phase Two

Figure 3.10 The Quantitative Process

3.7.2.2. Qualitative Data Analysis Procedure

In the second phase of the current study, qualitative data are analysed using thematic analysis. Clarke define *thematic analysis* (TA) as a method for identifying, analysing, and interpreting patterns of meaning ('themes') within qualitative data' extracted from research participants. It is a method for describing data, but it also involves interpretation in the processes of selecting codes and constructing themes. According to Kiger and Varpio (2020), a distinguishing feature of *thematic analysis* is its flexibility to be used within a wide range of theoretical and epistemological frameworks, and to be applied to a wide range of study questions, designs, and sample sizes. Recurring themes in interviews and open-ended questions improve data credibility by indicating that the idea is shared by a larger group of people .*Thematic analysis* is used in this study because of its adaptability in examining data for emergent topics or ideas pertinent to the research questions. Thus, TA necessitates careful planning and execution. Besides, the 'themes' should not be viewed as simply emerging from the data, as the researcher's role is crucial in how these topics are selected (Braun and Clarke, 2006).

There are two basic approaches to thematic analysis – *deduction* and *induction*. *The deductive process* involves using a theory, namely the adapted UTAUT model in this study, from which the propositions to be tested are derived (Saunders et al., 2016, 2019). In this approach, the key patterns and themes to be identified in the data are determined prior to analysis, and actively generated by the nature of the interview questions. There is an epistemological and ontological difference in coding from deductive and inductive approaches (Swain, 2018). Researchers using deductive methodologies tend to draw on more positive epistemologies, which regard data as 'pre-existing' or 'ready-made' forms of evidence in an external reality, and so use the term 'collecting data.' In contrast, those working with inductive methodologies use social constructivist and interpretive epistemologies that emphasise the emergent properties of the researcher working in a social setting where data have 'yet to be discovered', and therefore say they are 'generating data' or 'developing' them from new (Swain, 2018).

Thematic analysis in Phase 2 of the current study included summarising responses from open-ended questions and interview transcripts through data coding, categorising, and comparing to create emerging themes (Bryman, 2012). After analysing each

response from the open-ended questions and interview transcripts in turn, data were organised according to the research questions of the study. For each research question data were analysed electronically by using MAXQDA 2020 Software (hereinafter, MAXQDA) for recurring topics or patterns and then coded. This method of analysis contained features of inductive (bottom-up) approaches in the sense that themes were left to emerge themselves from informants' responses, also known as data-driven themes (Woolf & Silver, 2017, p. 167). Data coding involved assigning a label to several types of responses to a query with a repeating theme in order to review and analyse the significance they bring to the study (Richards 2009). The coded data extracts were then categorised into various themes, with those that didn't fit into any of them being assigned to a temporary theme named 'other.'

Using a semi-structured interview protocol (see Appendix E), all the six informants were interviewed face-to-face between September and October 2021. Each interview lasted approximately from 10 to 20 minutes and was audio-recorded and transcribed verbatim. Audio recording device was used. Notes were taken during the individual semi-structured interviews and reviewed later for key findings. The content of the interview protocol was grounded in the quantitative results from the first phase of the study (see Appendix B). An interview protocol was created to capture several main ideas. Because the goal of the qualitative phase was to explore and elaborate on the results of the statistical tests (Creswell et al., 2003), we wanted to understand why certain predictor variables differently contributed to the acceptance and use of ICT by EFL teachers. *Thematic analysis* was used to analyse the qualitative data collected during the semi-structured interviews.

The goal of qualitative analysis is to develop a conceptual framework that provides in-depth and broad understanding of the phenomenon (Hanson et al., 2019). Unlike statistical analysis which follows formulas and rules and can be performed using statistical analysis software, qualitative researchers are the 'instrument' of qualitative inquiry and analysis, especially analysis, as their interpretations and expertise are required to analyse the data (Patton, 2015, p. 882). It is, therefore, critical that qualitative analysis is performed systematically and clearly described (Patton 2015). The process of qualitative data analysis used in this study is shown in Figure 3.11 (adapted from

Makhlouf, 2017). While the quantitative data in the previous section was represented through statistical analysis and built around hypothesis testing, the interview data are presented mainly through thematic discussion.
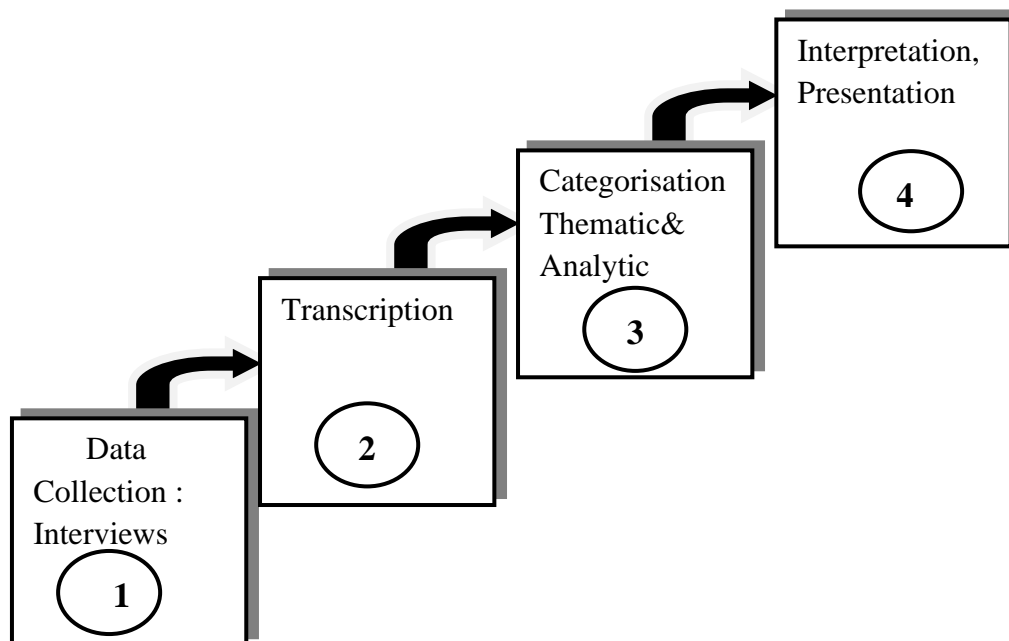
Figure 3.11 Steps in Analysing Interview Data (adapted from Makhlouf, 2017)

On the whole, the current case study has delineated a flexible process of a particular form of thematic analysis in Phase Two, which uses a hybrid approach involving deductive and inductive reasoning. Thus, the most crucial decision to make during the entire analytical process is to select a method that is consistent with our methodology and best answers our research questions (Swain, 2018). To this end, in this study, semi-structured interviews enabled us to explore some untouched points that were uncovered via the questionnaire. Thus, the interviews yielded in-depth results for the scope of this research and gave rise to the detailed exploration of the research questions. The results of the qualitative data are reported separately in Chapter 4. There are also some strategies for integrating and merging data analysis in the mixed methods research that must be acknowledged, and it is to this topic that we shall now turn.

3.7.2.3. Strategies for Integrating and Merging Data Analysis

The integrated findings from questionnaire and interviews were organised around the factors influencing teacher use of ICT and the relationships between teachers' demographic features and their use of ICT, their perceptions on the impact of factors.

One theme on the complexity in teacher use of ICT emerged from the questionnaire and interviews was also discussed. In doing so, we hoped to use the '*between-method triangulation*' to have a rich picture on EFL teacher use of ICT in their classroom teaching at Hassiba Benbouali University, Chlef.

As data integration is central to mixed methods analysis and interpretation in the current explanatory sequential study, the intent of integration, the procedures for integration, the representation of integration and the use of joint displays, and the interpretation of the results of integration take different shapes for the core designs and the complex designs. Hence, the joint display of quantitative and qualitative data is one of the integrative mixed methods analytic strategies used by contemporary researchers. Linking quantitative scores with qualitative quotes is an effective display technique for presenting data from mixed method studies (Lee & Greene, 2007). Joint display thus helps identify analytical relationships between quantitative and qualitative data sets, leading to a more complete understanding of the phenomena under investigation. Therefore, this study is the first attempt to examine the joint display of quantitative and qualitative data to ascertain a better understanding of the factors that account for teachers' acceptance and use of ICT in their teaching practices.

In light of the discussions above on the research process in regard to the adopted methodology, it would be easy to understand the rationale of research design and philosophies adopted for the current study. The explanatory technique was chosen in this study since the variables (of UTAUT) for the research were mostly well known in the literature and statistical techniques (SPSS V26) were used to identify the important factors in the context of Higher Education. Hence, the selected methodology using the Research Process Onion for this study has been summarised below in Figure 3.12. It depicts each layer as well as the parts of the research method that are required for this investigation. The current study aims to develop a framework that can be used to help teachers integrate and use technology into their classroom teaching practices and highlight factors that need to be considered when implementation takes place.
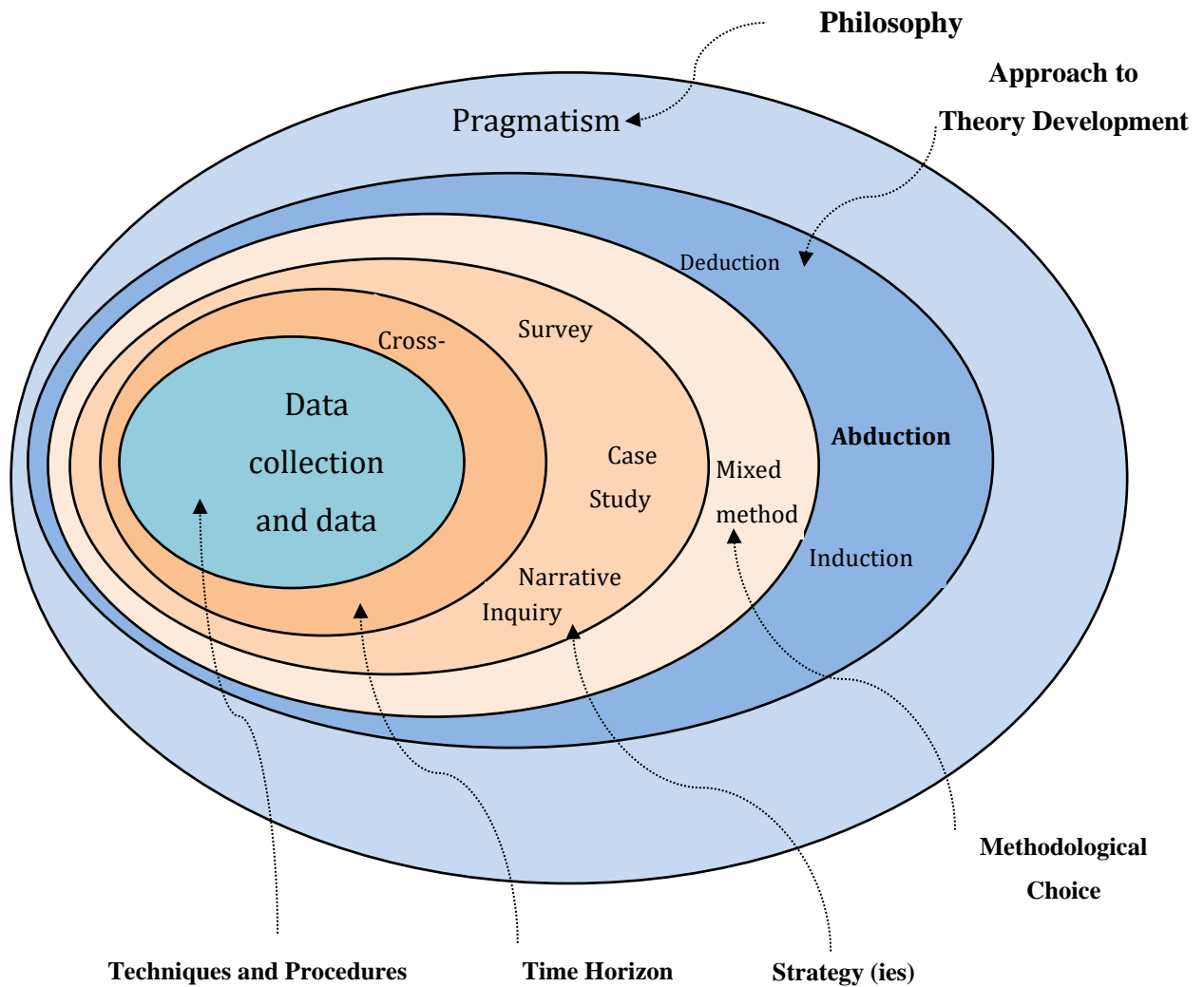
Figure 3.12 The Research Process '*Onion*' for this Study (Researcher'own Interpretation based on the Literature)

The above onion, which is based on reviewing the literature (e.g. Saunders et al., 2016, 2019), provides a systematic approach to tackling Chapter 3 of this thesis. According to this approach, research is like an onion with different covers that can be peeled one by one where the outer cover leads to the inner cover, and the cycle continues until one gets to the core of an onion. Key research methodology steps in the research onion approach include *research philosophy*, *approaches*, *strategies*, *choices*, *time horizons*, *techniques* and *procedures*. Thus, the above layered 'onion' of Saunders et al. (2016) is used as a guide to explain the methodology used in this explanatory sequential mixed methods study.

Put it in a nutshell, in the current mixed methods (MM) study, we collect and analyse both qualitative and quantitative data rigorously in response to research questions and

hypotheses, integrates (or mixes or combines) the two forms of data and their results, organises these procedures into specific research designs that provide the logic and procedures for conducting the study, and frames these procedures within theory and philosophy (Creswell & Plano Clark, 2018, p. 5). That is, MM is based on philosophical assumptions that guide the collection and analysis of data and the mixing of quantitative and qualitative collection techniques and analysis procedures.

3.8. Ethical Considerations

Conducting this research, we kept fulfilled all the ethical considerations which are deemed necessary in all the phases of research including data collection, data analysis, findings, and furnishing final recommendations. Prior permission was solicited from the Head of English Department for collection of data from the teachers. All the research informants were assured that their information will be entirely kept private. Responses were freely taken without any sort of burden on the informants. The informants from the survey and interview study were informed of the study's purpose, mode of participation and confidentiality. All informants reported that they understood the objective and method of this research and voluntarily signed consent forms.

The purpose of the survey and the in-depth interviews was explained to informants, along with assurances of confidentiality of respondents. To ensure the anonymity and confidentiality of the informants, we used codes in the questionnaire and pseudonyms in the interview to conceal the informants' identities. In a similar vein, five steps were followed in accordance with the ethical issues. First, the consent forms were signed to conduct the research. Second, the informants were fully informed about the study aims. Third, informants were informed that the data would be used only for research purposes. Fourth, the real names of participants would never be used but they would be given pseudonyms for anonymity. Fifth, every informant had a right to withdraw from the study at any stage if they wish to do so. The next two chapters focus on the analyses of the quantitative and qualitative data respectively.

Conclusion

This chapter has documented the research questions, philosophical assumptions, research design and the choice of the mixed-methods approach for the conduct of this study involving EFL teachers at Hassiba Benbouali University of Chlef in the West of Algeria. It has provided a detailed description of the study population and sampling, research variables as well as pilot testing of research tools. A descriptive framework of data-collecting instruments, namely a quantitative questionnaire administered to 45 EFL teachers and qualitative semi-structured interviews with six teachers, was provided. The chapter also described the choice of statistical analysis for the questionnaire data analysis by using IBM SPSS program (V26), as well as thematic analysis and analytical coding for the data obtained from the interviews by using MAXQDA 2020 Software. The aim of this mixed methods study was to examine relationships between variables – specifically, to ask how psychological and socio-demographic factors might influence teachers' acceptance and use of Information Technology in their teaching practices. The strategy of using a weaving approach in integrating findings through narrative has also been discussed. Issues of validity, reliability and ethics have also been considered. This chapter summarises the outline of the research process used in this study.

Chapter 3 has presented the methodology for collection of data for this explanatory sequential mixed methods study, Chapter 4 presents quantitative and qualitative research findings, respectively and Chapter 5 presents discussion of the findings, contributions, implications, conclusions and recommendations for future research.

CHAPTER FOUR
DATA ANALYSIS AND RESULTS

Introduction

The previous chapter has presented the plan followed to collect the data using two types of research methods which are: teachers' survey questionnaires and semi-structured interviews. The purpose of this explanatory sequential mixed methods study is to investigate the factors that influence EFL teachers' acceptance and use of Information and Communication Technology (ICT) in the Department of English at Hassiba Benbouali University of Chlef, West of Algeria. The study uses psychological variables as independent variables, and relevant information is gathered using six psychometric constructs linked to informants' perceptions of ICT use. The study has considered actual use of ICT as the dependent variable and relevant data are collected in respect of teachers' actual use of ICT for teaching practices.

This chapter presents the analysis and results of the data that help answer the research questions and test hypotheses guided by the research theoretical framework. This chapter is divided into two main sections: The first section deals with the quantitative findings of the study on the basis of the questionnaire (Sections 4.2,4.3 and 4.4). The second focuses on the qualitative findings of the individual semi-structured interview (section 4.4).

The analysis of the quantitative data was conducted using IBM SPSS (v.26), and it includes five main sections:

(i) descriptive statistical analysis to explore data about the main determinants of Higher Education EFL teachers in terms of Information Technology, including information on their socio-demographic characteristics, their exposure to ICT, and their actual usage of ICT.

(ii) descriptive statistics of the findings pertaining to Higher Education teachers' responses to various statements built-in the six psychometric scales. The mean scores for overall constructs are discussed.

(iii) reporting the relationship between psychological variables and teachers' actual use of ICT. The Pearson's correlations are used to establish the relationship between independent psychological variables and actual use of ICT, the dependent variable.

(iv)   using Multiple Regression Analysis (MRA) to present the proportion of variance in the dependent variable that is explained by the independent variables. The beta coefficients are used to examine the relative significance of each independent variable in explaining the dependent variable. Multiple regression analysis is carried out to to identify the extent to which each independent variable impacts on Algerian Higher Education EFL teachers'attitude tword using technology, intention to use and actual use of educational technologies. Finally, multiple regression analysis for differentiating the effect of moderator variables across independent and dependent variables is attempted.

(v)   presenting the differential analysis to test the proposed hypotheses pertaining to the mean differences in the independent and dependent variables among various socio-demographic characteristics of the informants. For variables that are coded as dichotomous, the independent sample t-test is used, and for variables with more than two groups, the one-way between groups analysis of variance (ANOVA) is employed.

Each of the UTAUT constructs are examined in terms of the responses from the questionnaire. Then, this chapter reports the findings of the analysis of the qualitative data from the semi-structured interviews using thematic analysis, before proceeding to consider both the quantitative and qualitative findings through triangulation.

Section One: Quantitative Data Analysis and Findings

This first section of the study is based on data collected from a questionnaire survey of 33 EFL teachers working at Hassiba Benbouali University of Chlef. The data pertaining to psychological and socio-demographic variables are subjected to detailed analysis for its effect on informants' actual use of ICT.

As explained in Chapter 3, a number of descriptive statistical methods, including frequency distribution, mean and standard deviation, and correlation are used in this study to analyse the quantitative data. To test the research hypotheses, several statistical techniques (inferential tests) are employed including multiple regression analysis and

moderation regression. Based on the revised research model of UTAUT, the following hypotheses are proposed:

Hypothesis 1: Relationship among Independent and Dependent Variables

*There is a significant relationship between Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude towards Using Technology, Behaviour Intention and **actual use of ICT among teachers**.*

Hypothesis 2: Predictors of Attitude Towards Using Technology

*There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions on the **criterion variable: Attitude towards Using Technology.***

Hypothesis 3: Predictors of Behaviour Intention to Use ICT

*There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence and Attitude Towards Using Technology on the **criterion variable: Behaviour Intention**.*

Hypothesis 4: Predictors of Actual Use of ICT

*There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude towards Using Technology and Behaviour Intention on the **criterion variable: Actual Use of ICT**.*

Moderation Hypotheses:

The current study has considered three socio-demographic characteristics of Higher Education teachers as moderator variables for their impact on independent and dependent variables. The data pertaining to socio-demographic variables include gender, age, and teaching experience.

Hypothesis 5: Gender Difference

There is no significant difference between the mean scores of male and female teachers in their:

5.1) *Performance Expectancy*

5.2) *Effort Expectancy*

5.3) Social Influence

5.4) Attitude Towards Using Technology

5.5) *Behaviour Intention*

5.6) *Actual Use of ICT*

Hypothesis 6: Age

There is no significant difference among the mean scores of teachers with respect to age and

6.1) *Performance Expectancy*

6.2) *Effort Expectancy*

6.3) *Social Influence*

6.4) *Facilitating Conditions*

6.5) *Attitude Towards Using Technology*

6.6) *Behaviour Intention*

6.7) *Actual Use of ICT*

Hypothesis 7: *Teaching Experience*

There is no significant difference among the mean scores of teachers with respect to years of teaching experience and

7.1) *Performance Expectancy*

7.2) *Effort Expectancy*

7.3) *Social Influence*

7.4) *Facilitating Conditions*

7.5) *Attitude Towards Using Technology*

7.6) *Behaviour Intention*

7.7) *Actual Use of ICT*

4.1. Descriptive Analysis of Teachers' Socio-Demographic Characteristics

4.1.1. General Information

As stated in Chapter 3, a total of 45 individuals were sent the link for the completion of the online survey questionnaire during the second semester of 2021. Out of these 45 respondents, eleven did not answer all the questions, and one only completed demographic information section. Therefore, data was included for 33 informants for analysis (73.3% of the target population).

In this section, general statistical methods were used for coding, where SPSS descriptive statistics were needed; and the researcher used statistical and mathematical techniques such as frequencies, tables and charts to display results.

Data analysis for both general and objective research questions are presented below:

4.1.2. Informant Profile

The questionnaire began with questions that would allow the researcher to create a profile of the informants based on key characteristics such as age and gender. This provided insight into the sample's representativeness as well as a broad overview of the respondents' educational backgrounds.

In this study, some of the socio-demographic characteristics of teachers are used as moderator variables. Table 4.1 presents the findings of the descriptive analysis of the moderator variables in terms of gender, age and years of teaching experience.

Table 4.1: Frequency Percentages of Socio-Demographic Characteristics of Teachers (N° 33)

Demographic	Characteristic	Frequency	Percentile (%)
Gender	Male	22	66.7
	Female	11	33.3
Age Group	**18-25**	2	6.1
	26-35	15	45.5
	36-45	9	27.3
	46-55	3	9.1

	56-65	4	12.1
	65 and over	2	6.1
	Less than 1 yr	2	6.1
	1-5 Yrs	9	27.3
Number of Years in Teaching Experience	**6-10 Yrs**	10	30.3
	11-15 Yrs	6	18.2
	16-20 Yrs	2	6.1
	21-25 Yrs	2	6.1
	26 Yrs and over	4	12.1

Source: Researcher's estimation by using SPSS V26.

- **Gender and Age**

In the sample studied, the demographic analysis showed the following description of the informant's profiles, as depicted in Table 4.1. The gender distribution of the informants showed that female informants at 66.7% comprised the majority (n=22), while male informants totalled 33.3% (n=11) only. While concerning the age of the informants, the analysis showed that 6.1% were in the age group of 18–25 years, 45.5% were between 26–35, 27.3% were between 36–45, 9.1% were between 46–55, 12.1% were between 56–65, and finally only 6.1 percent were more than and equal to 60 years old.

- **Number of Years in Teaching Service**

Regarding teaching experience, 30.3% of the sample reported between 6 and 10 years of experience. Twenty-seven percent of informants reported 1 to 5 years, and 18.2% reported between 11 and 15 years. The remaining 26% had less than 5 years of experience (see Table 4.1 above).

Given that the vast majority of the informants had been working for more than six years, the teachers in the sample were mostly long established in their institutions and had a wealth of experience to draw on when answering the questions of the survey

questionnaire. Also, long-serving teachers would have experienced teaching both without and with Information Technologies, as well as having seen the Algerian Ministry of Higher Education's initiatives to introduce ICT in institutions and schools (See Chapter 2 section 7.2.1).

- **The Status of Using ICT System at University (Mandatory or Voluntary)**

The overwhelming majority of the informants responded that the use of ICT system is voluntary 87.9% while few of the responding teachers said it is mandatory 12.1% (see Graph 4.1).
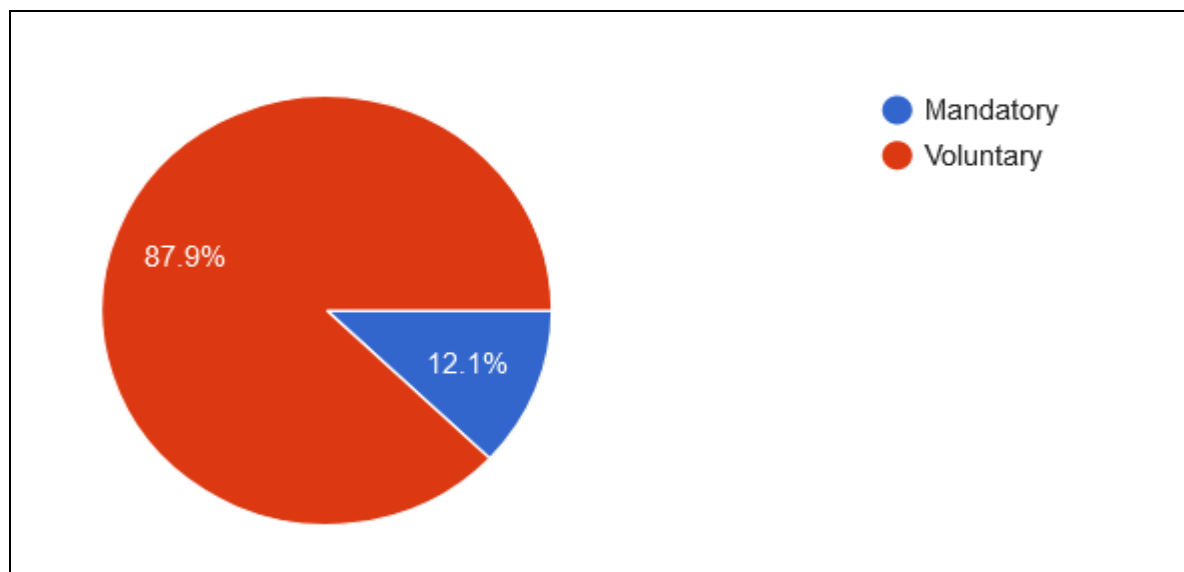
Graph 4.1: Percent Distribution of Informants by Status of Using ICT System

- **Teachers' Frequency of ICT Use**

The informants were also asked to indicate how frequently they used ICT for a variety of common teaching purposes. The responses for each item are scored on a *Likert-type 5*-point scale representing the frequency of use of ICT. The scale value being '1′ for *never*, "2′ for *once a month*, '3′ for *once every week*, '4′ for *2–4 times a week* and '5′ for *everyday*.

The findings show that the majority of the informants used ICT for 2–4 times per week (39.39%), while another group use it every day (27.27%). Another group of teachers use ICT once a week (21.21%) while others use it only once a month (9.09%). The questionnaire also established that the remaining 3.03% of the informants stated that they have never used ICT in their teaching practices (see Graph 4.2). It would be

interesting to understand why so few teachers use ICT, despite the fact that it is widely available and promoted by the Ministry of Higher Education in Algeria.

As well as creating a general profile of the sample, it was felt that more specific details about the frequency of using ICT that the teachers had was important in order to build a picture of the current practices in the use of ICT by Algerian university teachers.
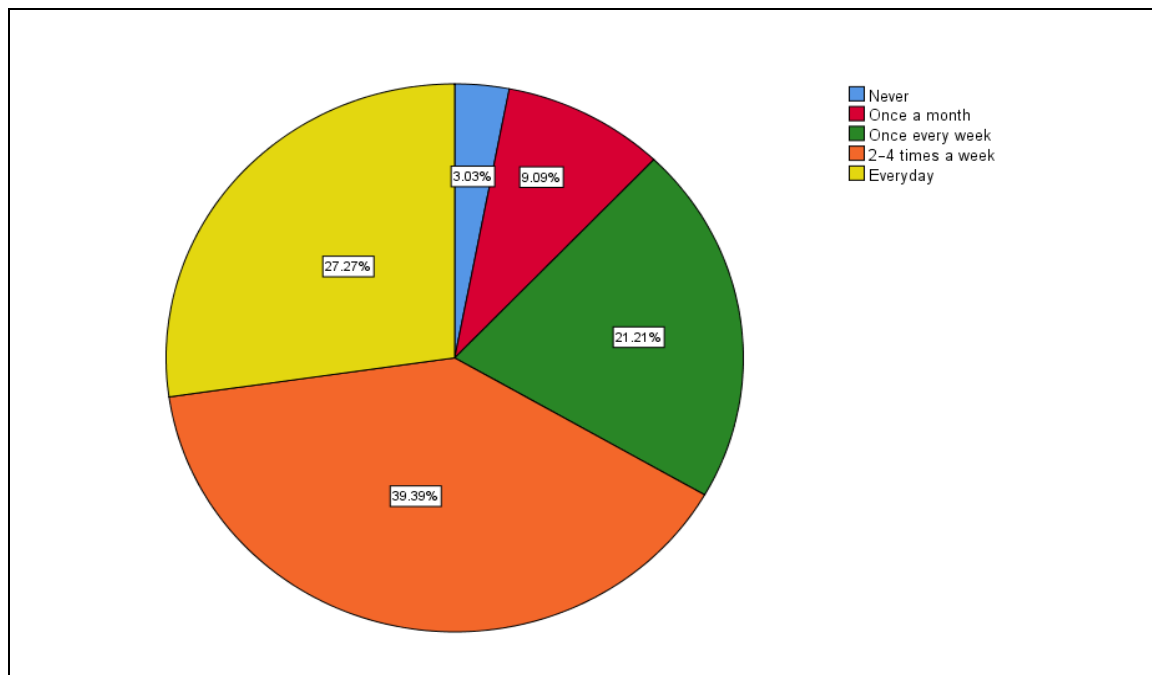
Graph 4.2: Teachers' Frequency of ICT Use

• **Tools Used in the Teaching Process**

The findings of the questionnaire established that the most used tools in the teaching process were: Projector 69.7% (which was the most popular tool), laptops and Computers; also that a small but significant number of informants used Mobile, Tablet and Computer Laboratory in the teaching process (see Graph 4.3).
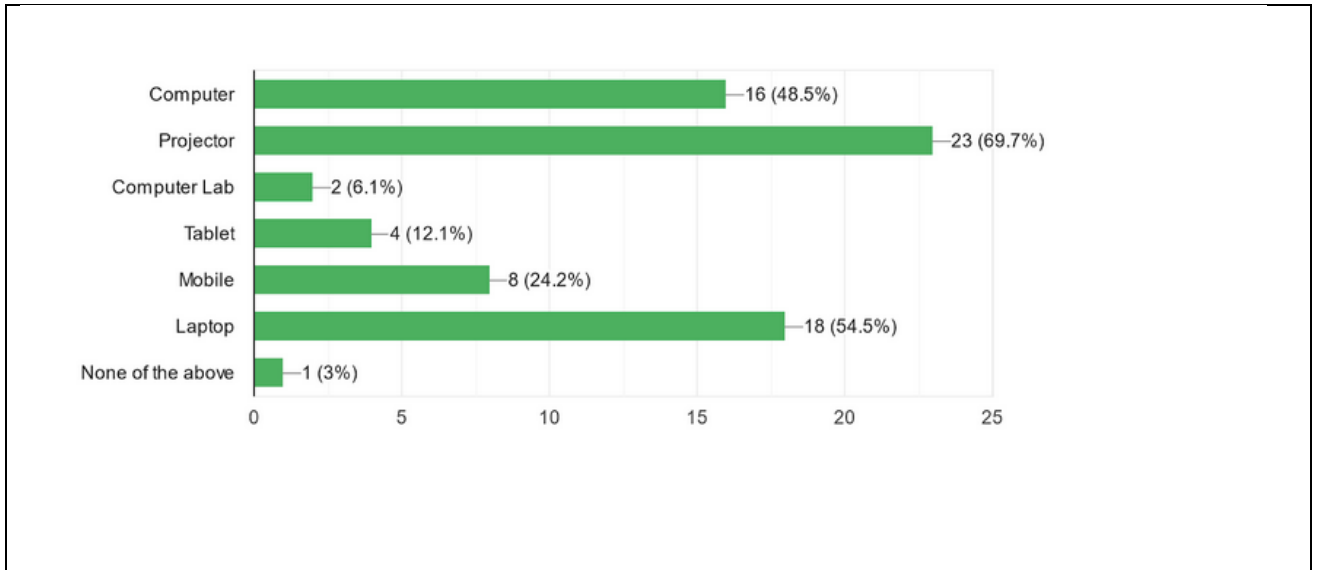
Graph 4.3: Percent Distribution of Informants by Tools Used in the Teaching Process

- **Technology Equipment Available at University**

The quantitative findings indicated that the most available appliance at the level of the University was the overhead projector, whilst the second most used facility was the laptop. Under half of the participants indicated that computer labs were available in their institution but less than a fifth had computers available in classrooms and no one had internet access there. Smart board technology, laptops and overhead projectors were available to a minority and 17% of the teachers had no access to any technology (see Graph 4.4).
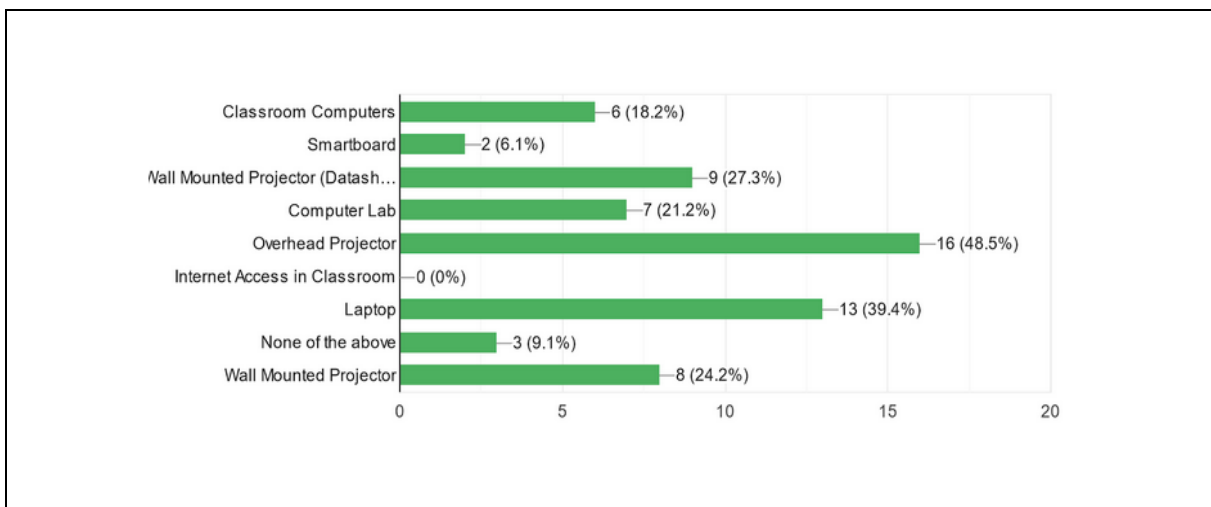
Graph 4.4: Percent Distribution of Informants by Availability of Technology Equipment at the University

- **Factors that Hinder Teachers from Teaching Using ICT**

The last multiple-choice question of the questionnaire asked teachers to choose the most challenging factors that might hamper their use of ICT in the teaching process.

The majority of the in-service EFL teachers (68.8%) responded that limitation of infrastructure is the main barrier they face, on the other hand (50%) said that the problem is related to the lack of technical support. Other respondents (4%) said that lack of accessing stable internet connection is their major problem, another group (34.4%) said that there is a lack of professional development opportunities and training (31.3%) and the final group said that complexity of integrating ICT (15.6%), lack of time and ICT knowledge (21.9%) were identified as major challenges to ICT usage in classrooms. Graph 4.5 shows the barriers that hamper teachers for using ICT in their teaching practices.
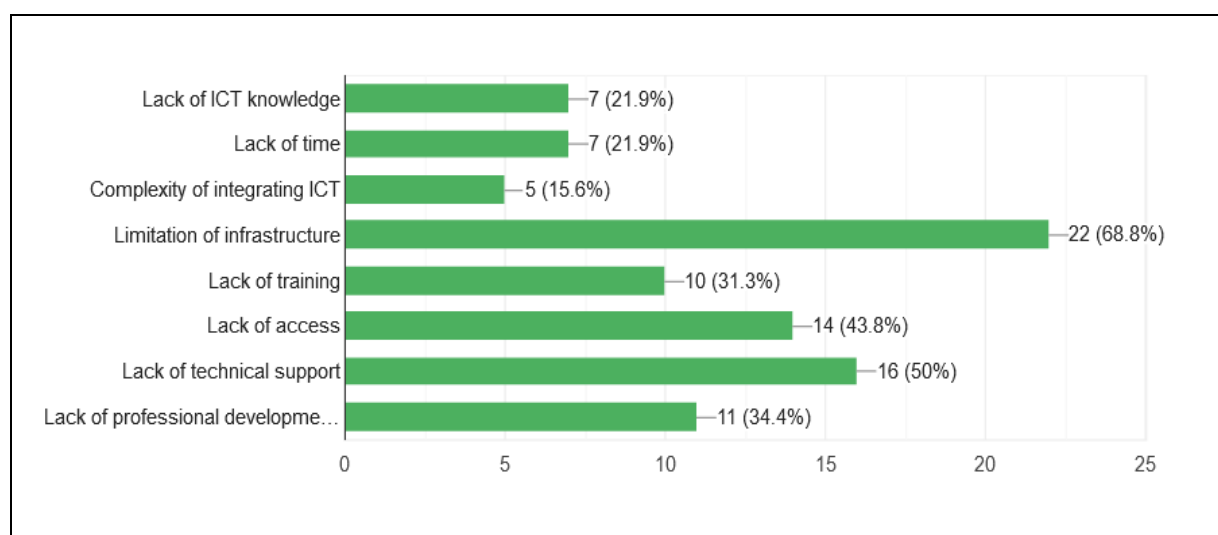
Graph 4.5: Percent Distribution of Informants by Hindering Factors for ICT Usage

ICT development programme among academic staff of Higher Educational Institutions especially by teachers of Foreign Languages is faced by a number of obstacles. Prominent among them is the lack of training and professional development opportunities for staff. Thus, the above-mentioned challenging factors merit further investigation.

It is therefore important that the Higher Educational Institutions in Algeria develop policies for the use of educational devices in teaching and learning. Consideration now turns to the teachers' perceptions based on the factors of the revised UTAUT in order to specifically highlight the potential benefits of Information Technology and to explore

the factors associated with the Algerian University teachers' perceptions on the acceptance and use of ICT to teach the English language at State Universities in Algeria.

4.2. Descriptive Analysis of Mean Scores for the Factors that Influence the Acceptance and Use of ICT

The mean and standard deviation were calculated after tabulating all of the informants' responses to questions about each factor to determine to what extent the variables (factors) influence (impact) their adoption and use of Information Technologies. Hence, descriptive statistics by using the software of IBM SPSS V26 were used to analyse the quantitative data from the questionnaire with a focus on means and percentages. The findings are presented in-line with the research questions and hypotheses which address the potential for the revised UTAUT to contribute to the discovery of the determinants that influence teachers' acceptance and use of ICT in their teaching practices. Table 4.2 presents the mean values of the study sample responses using the five-point Likert scale.

Table 4.2 The Manner of Calculating Mean by Using Lickert Scale

Degree of Agreement	1	2	3	4	5
	Strongly Disagreee	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Extant of Agreement	From 1 to less than 1.80	From 1.80 to 2.60	From 2.60 to less than 3.4	From 3.40 to 4.20	From 4.20 to less than 5

As we can see from the above table, we may interpret the arithmetic mean values of the study sample responses using the five-point Likert scale, which we relied on for the nature of the survey questions. The mean scores for various psychological variables are calculated by averaging the respective item-wise responses and presented in Tables below in each of the seven constructs.

The mean and standard deviation score were used to explain the informants' attitudes by asking the extent to which they agreed or disagreed with statements regarding the variables of *performance expectancy*, *effort expectancy*, *social influence*, *facilitating conditions, attitude toward using technology*, *behavioural intention* and *use*

behaviour. A typical scale was used in this analysis (strongly disagree=1, disagree=2, neutral=3, agree=4, and strongly agree=5). Descriptive tests were used to identify the mean score and standard deviation of each statement of the seven aforementioned variables. A score of less than three indicated that the informant disagreed with the items, while a score of more than three indicated agreement.

4.2.1. Performance Expectancy

Teachers were questioned on how they thought Information Technology was beneficial in their teaching practices.
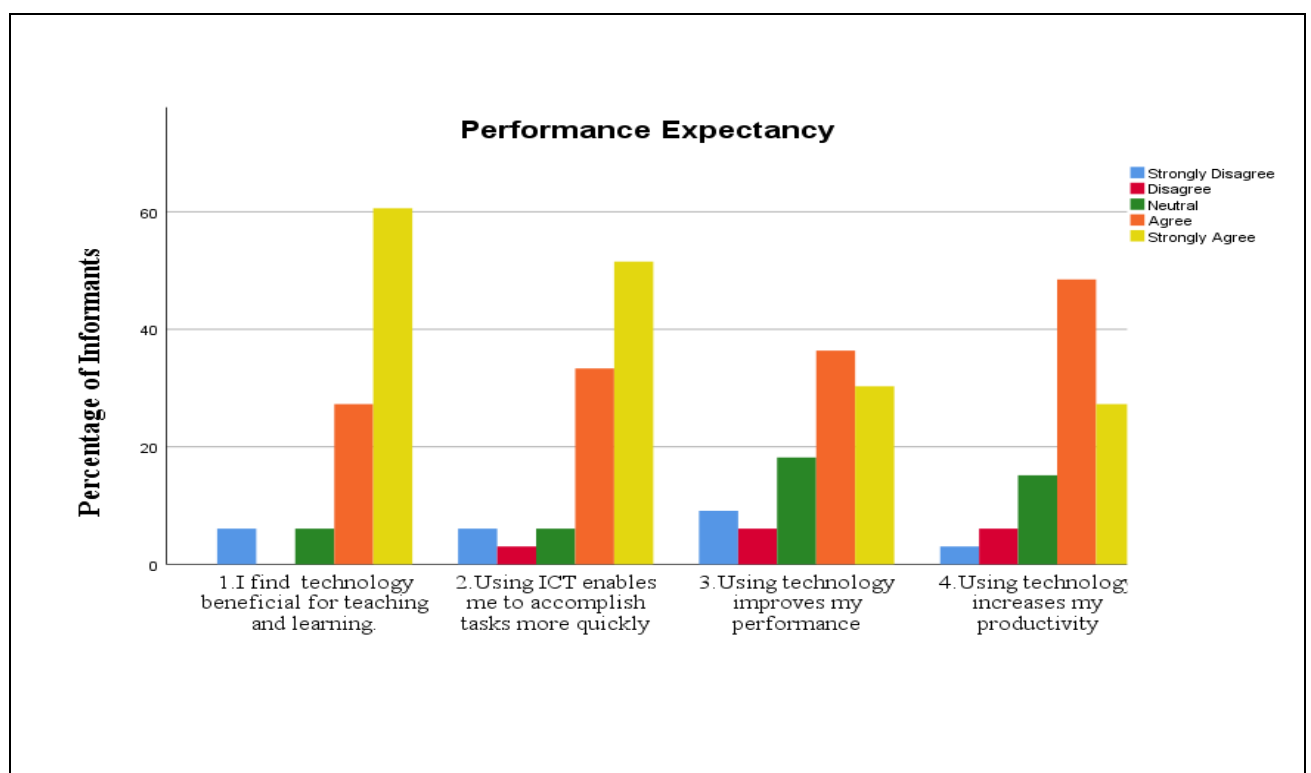
Graph 4.6 Informants' Responses about Performance Expectancy

    Graph 4.6 shows that the great majority of informants said they find Information Technologies beneficial for teaching and learning, as opposed to very few who were neutral and some who disagreed. Similarly, all but a few informants believed that using ICT enabled them to accomplish their tasks more quickly and thought that technology improved their performance. Finally, all but 6% of responding teachers believed that using Information Technologies enhanced their productivity. This implies that the use

of technology makes them more productive and effective in their work. These results indicate that Algerian Higher Education teachers have high expectations as to how Information Technologies can boost teaching quality and efficiency.

Table 4.3 Mean and Standard Deviation for PE (to determine how far teachers think Information Technologies are currently helping them to do their job)

No.	Items	Mean	Std. Deviation
PE1	I find technologies useful for teaching and learning.	4.36	1.055
PE2	Using ICT enables me to accomplish tasks more quickly.	4.21	1.111
PE3	Using technology improves my performance.	3.73	1.232
PE4	Using technology increases my productivity.	3.91	.980
Total		**4.05**	**0.991**

As shown in Table 4.3, the mean of teachers' responses regarding how Information Technologies are currently assisting them in their work (Performance Expectancy) is 4.05, with a standard deviation of 0.991, which falls within the range of 3.40 to 4.20. This suggests that teachers in Algerian Higher Education consider information technologies to be beneficial.

4.2.2. Effort Expectancy

Teachers were asked to evaluate how easy it was for them to use ICT in their job.
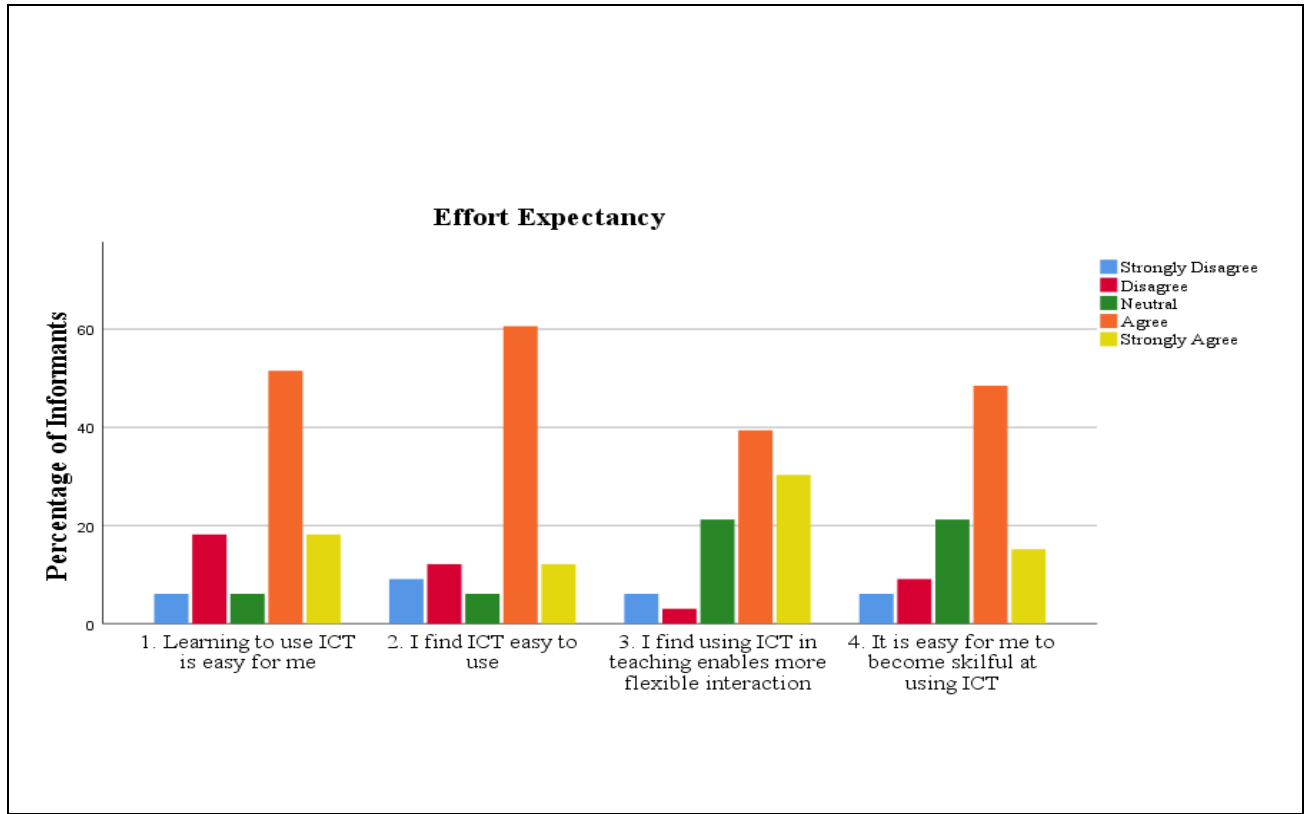
Graph 4.7 Informants' Responses about Effort Expectancy

The findings of the questionnaire show that most informants believe that using and learning how to use Information Technologies are easy and that they have the skills they need to use in ICT in their Higher Education Institution (see Graph 4.7). However, there were some neutral and negative beliefs that would merit further investigation. The vast majority also thought that it was easy for them to be skilful at using ICT. This implies that ICT impacts effort expectancy because it is seen as easy to use. Also, the skills needed by University teachers to use ICT already exist and teachers think that the use of ICT enhances flexible interaction. Hence, Information Technologies can easily be used in the teaching and learning process.

Table 4.4 Mean and Standard Deviation for EE (to determine how easy teachers find it to use **Information and Communication Technologies**)

No.	Items	Mean	Std. Deviation
EE1	Learning to use ICT is easy for me.	3.58	1.173
EE2	I find ICT easy to use.	3.55	1.148
EE3	I find using ICT in teaching enables more flexible interaction.	3.85	1.093
EE4	It is easy for me to become skillful at using ICT.	3.58	1.062
	Total	**3.63**	**0.994**

As shown in Table 4.4, the mean of teachers' responses about how easy they find it to use Information and Communication Technologies (Effort Expectancy) is 3.63 and the standard deviation 0.994, which lies within the interval 3.40 to less than 4.20. This implies that teachers in Algerian Higher Education generally believe it is easy to use ICTs in their teaching practices.

4.2.3. Social Influence

Teachers were asked about their perceptions of how important others viewed their use of ICT.
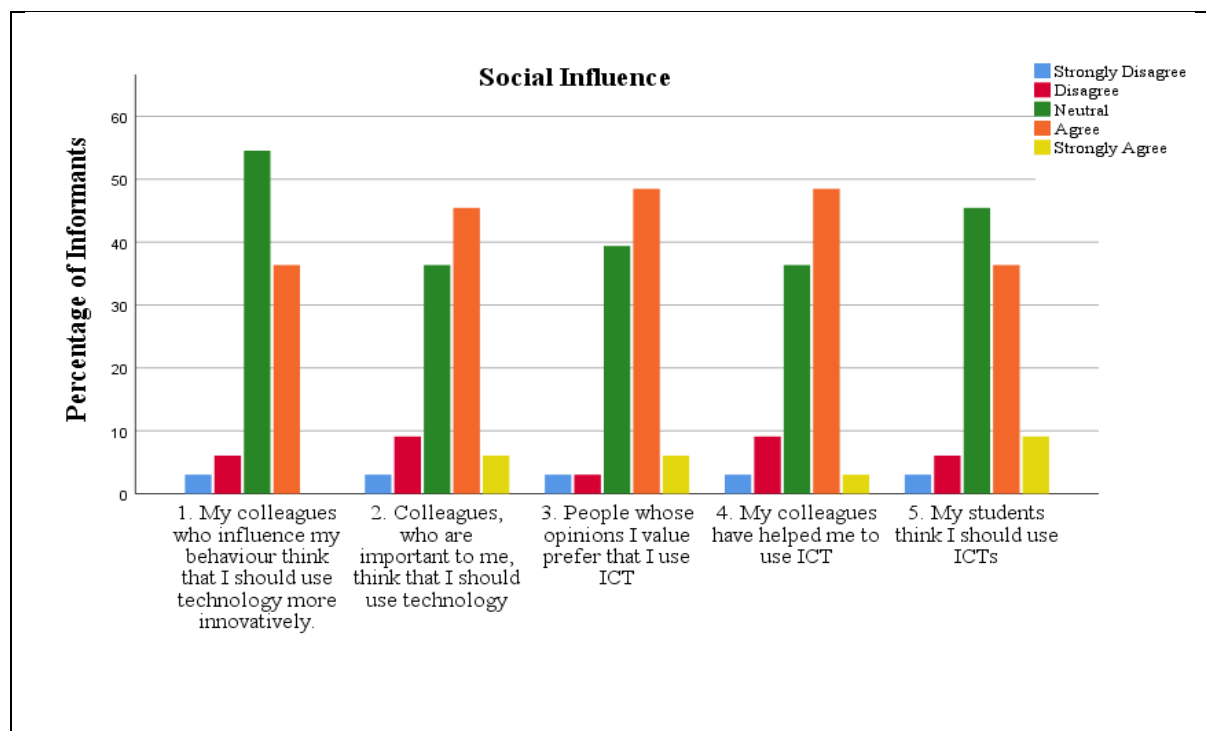
Graph 4.8 Informants' Responses about Social Influence

The results of the questionnaire show that social influence of Information Technology has an impact on these users. To begin with, the majority of informants believed that their colleagues thought they should use ICTs. A few people disagreed on the topic. Although the majority of respondents stated that colleagues helped each other in using ICT, a small minority did not agree. Similarly, considerable proportion of teachers were also neutral or did believe their students wanted them to use ICT.

This demonstrates that social influence has a favorable impact on teachers' perceptions of ICT use because they think their colleagues believe teachers should use ICT and help one another do so, as well as people with valuable opinions. However, when it came to students, there was some uncertainty. Nonetheless, there were also quite a lot of neutral responses which suggests that some teachers may be quite uncertain about their perceptions about how significant others regarded their use of ICT and this factor needs further investigation (see Graph 4.8).

Table 4.5 Mean and Standard Deviation for SI (to determine teachers' current perceptions of other people's ideas about their use **of Information Technologies**)

No.	Items	Mean	Std. Deviation
SI1	My colleagues who influence my behaviour think that I should use technology more innovatively.	3.24	.708
SI2	Colleagues, who are important to me, think that I should use technology.	3.42	.867
SI3	People whose opinions I value prefer that I use ICT.	3.52	.795
SI4	My colleagues have helped me to use ICT.	3.39	.827
SI5	My students think I should use ICTs.	3.42	.867
Total		**3.40**	**0.570**

The above Table 4.5 shows that the mean of sample responses about teachers' present perceptions of other people's ideas about their use of ICT (Social Influence) is 3.40 with a standard deviation of 0.570, which lies within an interval of 3.40 to less than 4.20. This shows that teachers' current perceptions of other people's views on their usage of ICT are mostly positive. It would be beneficial to delve deeper into the nature of these positive and negative societal impacts.

4.2.4. Facilitating Conditions

Teachers were questioned about resources and the technical assistance required to use them.
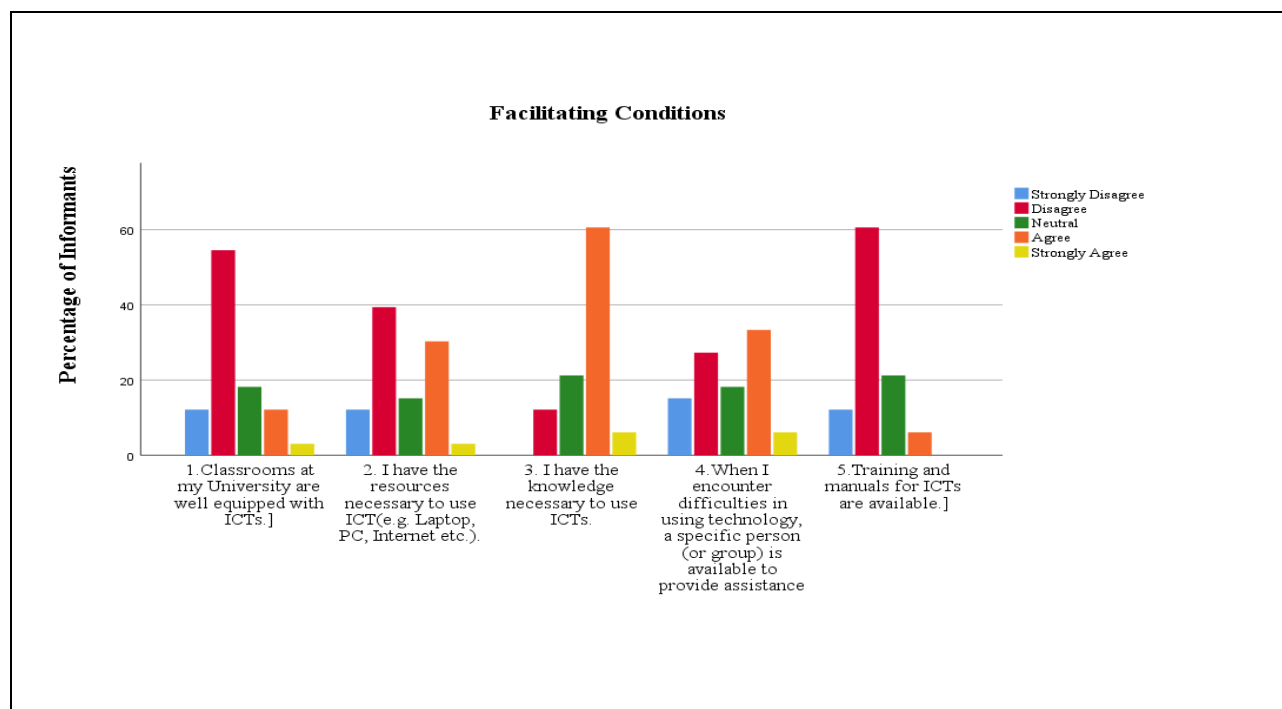
Graph 4.9 Informants' Responses about Facilitating Conditions

The questionnaire established that the majority of informants do not feel that classrooms at their University are adequately equipped with the necessary ICT resources. Although some teachers reported that their university did not provide technical assistance and there were insufficient resources available such as Internet connection, most informants said that there was a specific person (or group) available for assistance with the use of technologies when encountering difficulties. Furthermore, the findings showed that the great majority of informants indicated that training and manuals for ICTs were not available to them at the level of their institution; as opposed to just few who received training. Hence, this point of training merits further investigation.

From the preceding findings, it is clear therefore that there are insufficient facilitating conditions for Information Technologies, and these restrictions lead to University teachers' inability to fully take advantage of the opportunities afforded by ICT (see Graph 4.9).

Table 4.6 Mean and Standard Deviation for FC (to determine what teachers think about the current facilities that support their use of Information Technologies)

No.	Items	Mean	Std. Deviation
FC1	Classrooms at my University are well equipped with ICTs.	2.39	.966
FC2	I have the resources necessary to use ICT (e.g., Laptop, Internet etc.).	2.73	1.126
FC3	I have the knowledge necessary to use ICTs.	3.61	.788
FC4	When I encounter difficulties in using ICT in classroom, I know where to seek assistance.	2.88	1.219
FC5	Training and manuals for ICTs are available.	2.21	.740
Total		**3.07**	**0.966**

As shown in Table 5.6, the mean of sample responses about what teachers think about the current facilities that support their use of ICT (FC) is 3.07, with a standard deviation of 0.966, which lies within an interval of 2.60 and less than 3.40. This indicates that the teachers' attitudes towards the current facilities that support their use of information technologies are at a medium level.

4.2.5. Teachers' Attitudes Towards Using Technology

This part of the questionnaire sought to discover how teachers felt about using **ICT**.
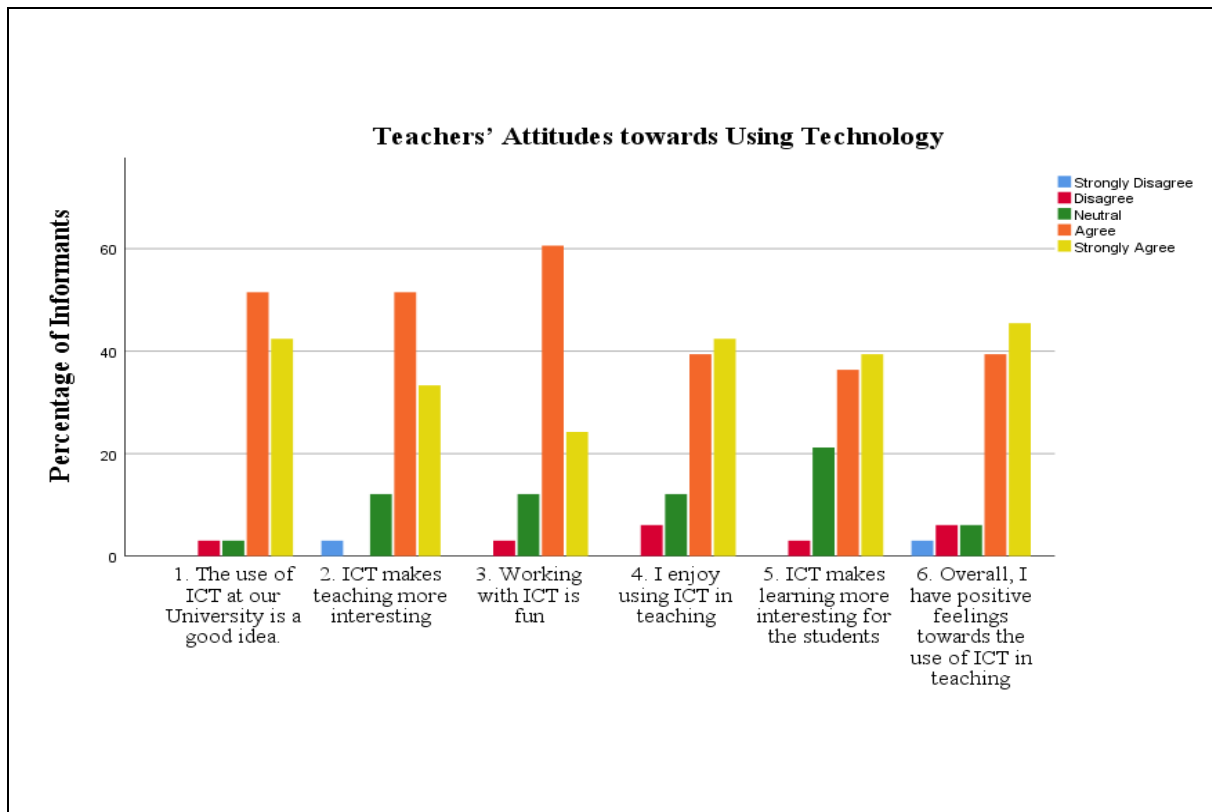
Graph 4.10 Informants' Responses about Attitudes towards using Technology

The results of the questionnaire revealed that respondents have a generally positive attitude toward information technology in their teaching practices. The vast majority of teachers agreed that using ICT at their University was a good idea and that it made teaching and learning more exciting for both teachers and students, and that they enjoyed using it in their classrooms. Working with ICT was enjoyable for the majority of the teachers. Overall, teachers were enthusiastic about the use of ICT in the classroom. Generally, this indicates that university teachers have a positive attitude toward the use of ICTs and an understanding that they may be inspirational tools that enhance communication between teachers and students. There were a few teachers who were neutral on the topic and a tiny number who had negative feelings, so it would be beneficial to delve more into attitudes (see Graph 4.10).

Table 4.7 Mean and Standard Deviation for ATUT (to determine teachers' attitudes toward using ICT)

No.	Items	Mean	Std. Deviation
ATT1	The use of ICT at our University is a good idea.	4.33	.692
ATT2	ICT makes teaching more interesting.	4.12	.857
ATT3	Working with ICT is fun.	4.06	.704
ATT4	I enjoy using ICT in teaching.	4.18	.882
ATT5	ICT makes learning more interesting for the students.	4.12	.857
ATT6	Above all, I have positive feelings towards the use of ICT in teaching.	4.18	1.014
	Total	**4.16**	**0.627**

As shown in Table 4.7, the mean of teachers' attitudes toward using technologies is **4.16**, with a standard deviation of **0.627**. This lies within an interval of **3.40 to less than 4.20** and indicates that the teachers' attitudes toward using Information Technologies are positive.

4.2.6. Behavioural Intention

Teachers were asked about their intentions for future use and training in e-learning.
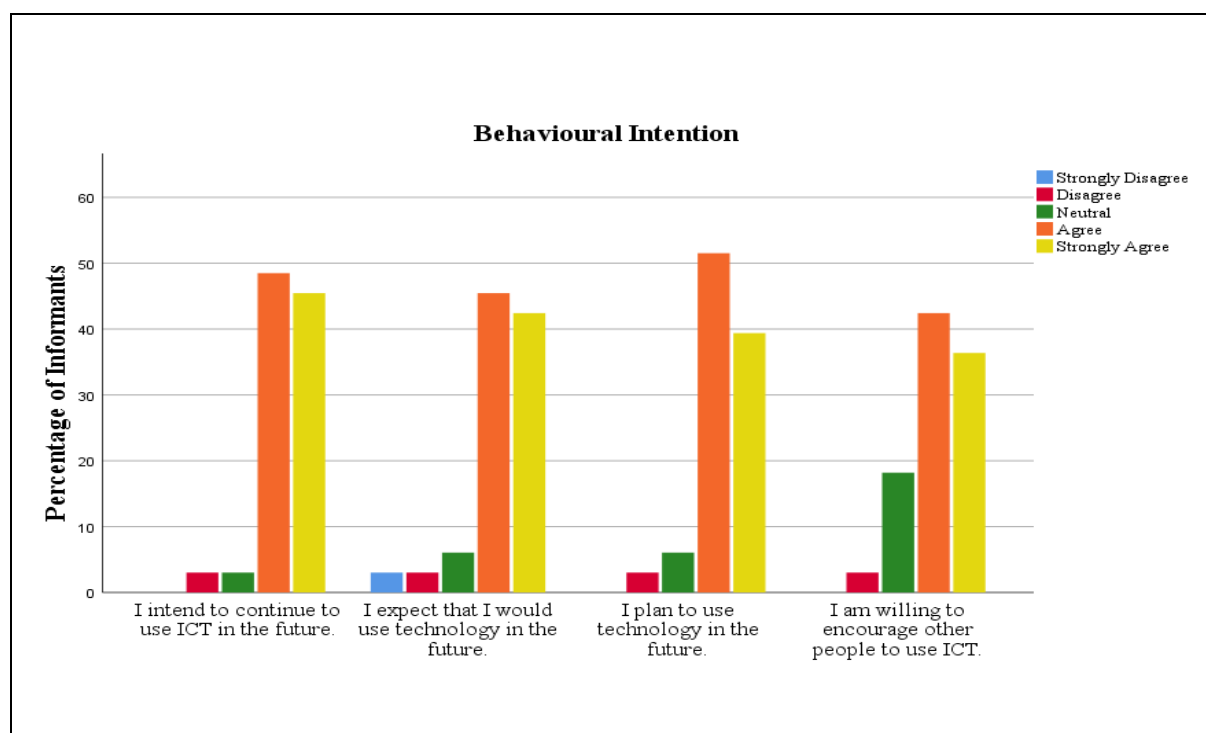
Graph 4.11 Informants' Responses about Behavioural Intention

The findings of the questionnaire established that a large majority of informants intend to use ICT in the future and also predicted that this would certainly take place. The first question suggests that the informants believe that they will be using technologies in the future, whereas the second question introduces an element of doubt. A large majority of participants plan to use ICT in the future, although a small number are uncertain or do not plan to use it. Furthermore, the majority of informants have the willingness of encouraging others to use ICT. These results show that there are positive behavioural intentions for using and encouraging others to use ICTs by Algerian Higher Education teachers at Hassiba Benbouali University of Chlef. This is of paramount importance if they are to successfully use these technologies to enhance the teaching and learning process (see Graph 4.11).

Table 4.8 Mean and Standard Deviation for BI (to determine teachers' behavioural intention to use ICT)

No.	Items	Mean	Std. Deviation
BI1	I intend to continue to use ICT in the future.	4.36	.699
BI2	I expect that I would use technology in the future.	4.21	.927
BI3	I plan to use technology in the future.	4.27	.719
BI4	I am willing to encourage other people to use ICT.	4.12	.820
Total		**4.24**	**0.6831**

Table 4.8 shows that the mean of sample responses about teachers' BI to use ICT is **4.24**, with a standard deviation of **0.6831**. This lies within an interval 4.20 to 5, and indicates that the teachers' behavioural intention to use ICT is very high. Hence, the intention of Higher Education teachers to use ICT in future is encouraging. The mean score of 4.24 (SD=0.68) confirms that the informants are favourably disposed towards the use of ICT in the future.

4.2.7. Actual Use of Information Technologies (Use Behaviour)

As a contrast to intention to use, teachers were asked about their actual use of Information Technologies.
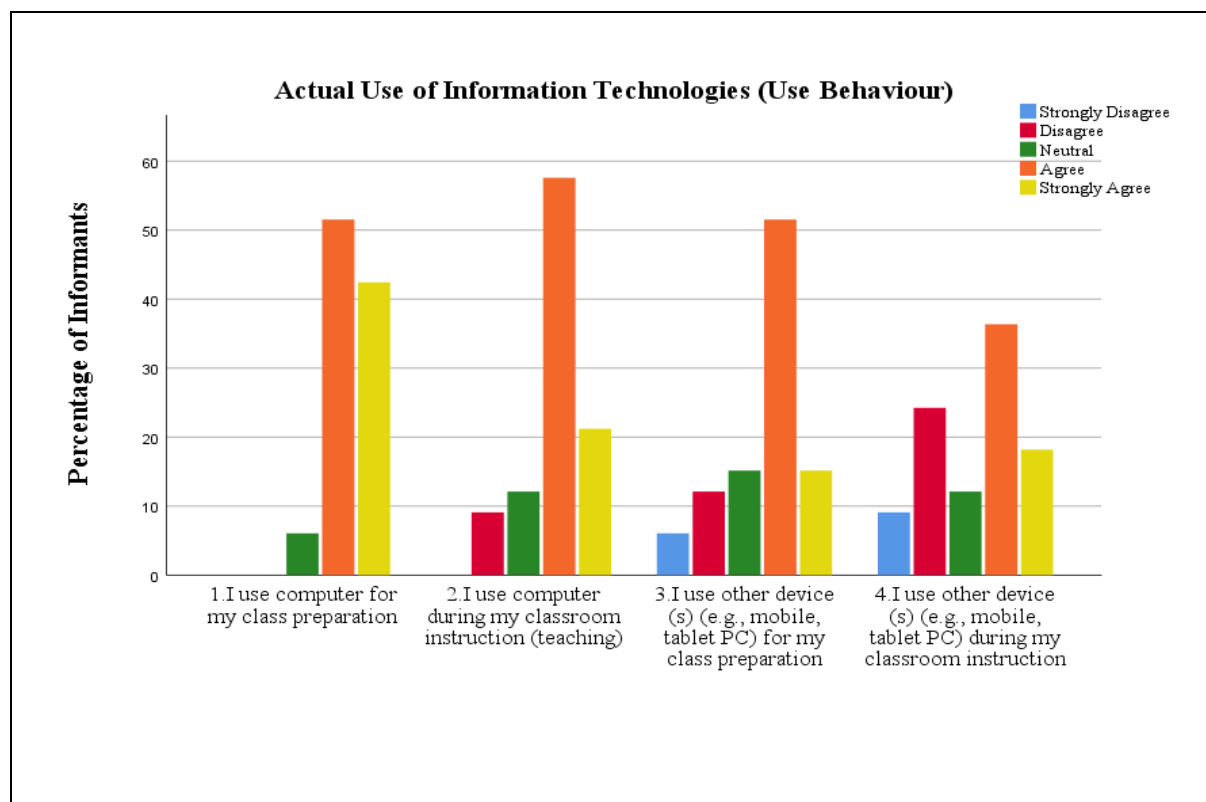
Graph 4.12 Informants' Responses about Actual Use of Information Technologies

The questionnaire findings found out that most informants use computers as part of their classroom preparation and for classroom teaching practices. The majority of the informants stated that the they use many of their personal ICT devices such as mobiles and tablets whether for the preparation of their courses or for teaching practices in the classrooms. However, a small but significant minority use neither mobiles nor tablets as part of their teaching. Using these particular technological devices arguably allows teachers more flexible ways of sharing information with their students. It would be beneficial to have more details about what precludes the use of these devices and the extent to which poor facilitating conditions explain it as opposed to teachers' choice (see Graph 4.12).

Table 4.9 Mean and Standard Deviation for AU (to determine teachers' actual use of Information Technologies)

No.	Items	Mean	Std. Deviation
AU1	I use computer for my class preparation.	4.36	.603
AU2	I use computer during my classroom instruction (teaching).	3.91	.843
AU3	I use other device (e.g., mobile, tablet PC) for my class preparation	3.58	1.091
AU4	I use other device (e.g., mobile, tablet PC) during my classroom instruction.	3.30	1.287
Total		**3.7879**	**0.73453**

As shown in Table 4.9, the mean of teachers' actual use of Information Technologies is 3.78, with a standard deviation of 0.73453, which lies within an interval of 3.40 to less than 4.20; and indicates that teachers' actual use of Information Technologies is high.

The highest level of agreement placed by the informants was on the two dependent variables of the revised UTAUT model: Behavioural Intention and Teachers' Attitudes towards Using Technology at 4.24 and 4.16, respectively, indicating the Algerian Higher Education teachers' favourableness towards acceptance and use of ICT in their teaching practices. This was followed by performance expectancy (4.05) and effort expectancy (3.63), which is indicative of the usefulness and the ease of use of ICT by EFL teachers in performing their teaching tasks. Other variables, including social influence (3.40) and facilitating conditions (3.07) indicate moderate agreement in the views of the teachers in Algerian universities about the use of ICT in EFL classrooms. For the use behaviour of ICT to teach English as a Foreign Language, the mean was 3.78 (positioned to 'agree' on the scale), thus indicting that the views of teachers are high.

4.3. Extent of Factors Influencing EFL Teachers' Acceptance and Use of ICT

4.3.1 Correlation Analysis

The third section deals with the data pertaining to relationship between teachers' actual use of ICT, the dependent variable, and the psychological factors that are used as independent variables: 1) Performance Expectancy; 2) Effort Expectancy (ICT ease of use); 3) Social Influence; 4) Facilitating Conditions; 5) Attitude Towards Using Technology; and 6) Behaviour Intention. To establish the relationship among the various items of dependent and independent variables, detailed analyses were carried out using correlation coefficients.

Correlations were used to investigate the extent to which different factors influence the acceptance and use of ICT. A correlation coefficient enables the quantification of the strength of the linear relationship between two ranked or numerical variables. This coefficient (usually represented by the letter r) can range on any value +1 to -1, with +1 indicating a perfect positive relationship, 0 indicating no relationship, and -1 indicating a perfect negative or reverse relationship. Therefore, correlation coefficients between -1 and +1 represent weaker positive and negative correlations, with 0 denoting that the variables are perfectly independent (Saunders, Lewis, Thornhill 2019).

As per the convention, correlation coefficients that are statistically significant at the 0.01 level (2-tailed) are indicated by two stars (**) and that are significant at the 0.05 level (2-tailed) are indicated by one star (*). Hence, two-tailed significance levels were used, and the correlation was considered significant if the significant value was <=0.01 and of no significance if the two-tailed significant value was>0.01. Therefore, the current study has adopted the following convention to describe the strength of relationship among variables and its items:

coefficient of .70+ = very strong relationship between factors

coefficient between .50 and .69 = substantial relationship between factors

coefficient between .30 and .49 = moderate relationship between factors

coefficient between .10 and .29 = weak relationship between factors

coefficient between .01 and .09 = negligible relationship between factors

It may be noted from the above convention that the correlation coefficients (r) indicate only the strength of the relationship between the variables and not the direction of causality. Pearson's Rank Correlation Coefficient Statistical tests assess the strength of the relationship between two ranked data variables and can be used to determine whether or not relationships exist solely by chance (Saunders, Lewis, Thornhill 2019).

Given that the questionnaires were delivered online and responses were required to progress, there were no missing items in the analysis of this study. The correlations were related to the parts of the research questions that dealt with measuring the extent to which the factors influenced each other.

Relationship among Independent and Dependent Variables

Hypothesis 1: Relationship among Independent and Dependent Variables

*There is a significant relationship between Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, Behaviour Intention and **Actual Use of ICT among teachers**.*

Table 4.10 presents the Pearson correlation coefficients among the core constructs of the model proposed in this study. The correlation matrix illustrates significant relationship between the informants' actual use of ICT and all the independent psychological variables. In terms of strength of the relationship, the Behavioural Intention of using ICT has a substantial positive relationship with informants' Attitude Towards Using Technology (r=.650), and Effort Expectancy (r=.536, p=.001). The analysis shows a statistically significant moderate relationship for Behavioural Intention with that of informants' Performance Expectancy (r=.430, p=.012), followed by Facilitating Conditions (r = .347, p=.048), and Social Influence (r =.309, p=.080) for the acceptance of ICT.

The informants' attitude towards use of technology has a substantial positive relationship with Performance Expectancy (r=.561) and Effort Expectancy (r=.553). Attitude has a moderate (r=.413) relationship with Social Influence. However, attitude towards using technology has a weak relationship with facilitating condition (r=.117).

Table 4.10: Pearson's Correlation Matrix of Independent and Dependent Variables

Variable	1.PE	2.EE	3.SI	4.FC	5.ATUT	6.BI
1. Performance Expectancy (PE)						
2. Effort Expectancy (EE)	.442**					
3. Social Influence (SI)	.265	.408*				
4. Facilitating Conditions (FC)	.126	.494**	.388*			
5. Attitude Towards Using Technology (ATUT)	.561**	.553**	.413*	.171		
6. Behavioural Intention to Use (BI)	**.430***	**.536***	**.309**	**.347***	**.650***	
7. Actual Use of ICT (AUT)	.244	.458**	.560**	.490**	.319	**.530***

** Correlation is significant at the 0.01 level (1-tailed) / p<.01
* Correlation is significant at the 0.05 level (1-tailed) /p<.05

A further analysis of correlation among the psychological variables is carried out to establish their relationship with the actual use of ICT. When looking at the potential predictors of Use Behaviour in regard to ICT, it is found that actual use of ICT is statistically significant in its relationship with the remaining psychological variables. The results have shown a significant substantial relationship of actual use of ICT with Behavioural Intention (r=.530, p=.002), and moderate relationship with Facilitating Conditions (r=.490, p=.004), followed by Attitude Towards Using Technology (r=.319, p=.070). Therefore, the results show a significant relationship of actual use of ICT with all the psychological variables, which indicates that, all relationships between the independent variables and the dependent variable in the model , are positive leading to the acceptance of proposed hypothesis 1.

Therefore, the first hypothesis, assuming the correlation among the psychological variables with the actual use of ICT, was totally accepted. Specifically, *Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology* and *Behavioural Intention* moderately correlated with the actual use of ICT.

4.3.2 Multiple Regression Analysis

Multiple regressions are an extension of simple (bi-variate) regression (with only one independent variable) to a multivariate analysis where two or more independent variables could be used (Hair, Black, Babin, Anderson 2019). Multiple regression is undoubtedly the most widely used multivariate dependence technique. The primary basis for the popularity of regression has been its ability to predict and explain metric variables. Thus, the major objective of multiple regressions is to enable the researcher of the current study to investigate the relationship between *a single dependent (creterion) variable* and *several independent (predictor) variables*. Hence, the objective of multiple regression analysis is to use the independent variables whose values are known to predict the single dependent value selected by the researcher. Thus, the final result of multiple regressions is the line of best fit (development of a regression equation) between the dependent variable and several independent variables.

Regression and moderation analysis were conducted to investigate the factors and test the research hypotheses concerning the teachers' use behaviour and behavioural intention regarding the adoption of Information Technology in their teaching practices. Using the multiple regression model, the formulated hypotheses mainly focused on testing the relationship of Behavioural Intention (BI), and Use Behaviour (UB) with Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC) and Teachers' Attitudes towards Using Technologies (ATUT). Hence, the researcher of the present research conducted regression analysis (Stepwise) to determine mainly the influence of the independent variables: PE, PE, EE, SI, FC and ATUT on the two dependent (criterion) variables employed which were Behavioural Intention (BI) and the Actual Use of ICT (AU). In other words, the interest was to determine how the variation in Behavioural Intention and Use Behaviour could be reliant on the other variables.

The current study, which was undertaken on a sample of 33 University teachers, focuses on the factors that influence ICT usage. The mean score for actual use of ICT by the teachers is the dependent variable. The mean scores calculated for each of the six psychological variables are considered as predictor variables. In addition, the influence of socio-demographic variables on the dependent variable is also investigated.

Based on the fact that there are three dependent variables in the revised model (ATUT, BI and AU), three separate regression models were tested and analysed in order to investigate the major determinants of ICT usage among Higher Education teachers.

Regression Model 1: Using enter method, four psychological variables as predictors of attitude towards using Technology as dependent variable.

Regression Model 2: Using enter method, five psychological variables as predictors of behaviour intention as dependent variable.

Regression Model 3: Using enter method, three psychological variables as predictors of actual use of ICT as dependent variable.

In order to establish the extent to which a factor's variability can be explained or caused by its relationship to another factor, the R^2 statistical method is used. In trend analysis, the coefficient of determination is used, and computed as a value lying between 0 (0%) and 100 (100%); the higher the value, the better the fit. In regression analysis, R-squared is a goodness-of-fit measure for linear regression models. It is also termed as the coefficient of determination (Raza, Qazi 2020). As the coefficient of correlation is indicated by **r**, the coefficient of determination is symbolised by $\mathbf{R^2}$ as it is the square of the coefficient of correlation. Following the rules of thumb used by many researchers, the respective R2 values of 0.25, 0.50, or 0.75 can be described as weak, moderate, or substantial.

In order to avoid indirect effects and mediation effects, processing ATUT, BI and USE as three dependent variables respectively, three separate models were constructed based on the three hypotheses (direct and moderating effects on ATAUT, direct and moderating effects on BI, direct effects on USE) to identify the relationships and moderating effects. The combined explanatory power and statistical significance for each regression models are provided in ANOVA (analysis of variance) tables. The contributions of each predictor variables in the regression models are presented in regression coefficient tables. Furthermore, the effect of each predictor on the dependent (criterion) variable is interpreted using the standardised coefficient known as Beta value (ß). The strength of the effect in this study is classified as follows: ß 0.2 is a weak effect, ß between 0.2 and 0.5 is a moderate effect, and ß>.5 is a strong effect.

Regression Model 1: Predictors of Attitude Towards ICT Use

The First Step:

The researcher conducted regression analysis (Stepwise) to determine the impact of the independent variables: (Performance Expectancy – Effort Expectancy – Social Influence and Facilitating Conditions) on the intervening (mediating) variable employed which was Attitude towards Using Technology. A multivariate analysis technique was conducted in three steps: Step one is shown in Figure (4.1).

Figure 4.1 Research Model – (part 1)

Hypothesis 2: Predictors of Attitude Towards ICT Use

*There exists a significant contribution of predictor variables: 1) Performance Expectancy, 2) Effort Expectancy, 3) Social Influence and 4) Facilitating Conditions **on the criterion variable: Attitude towards Using Technology (ATUT).***

Using regression analysis, the current study attempts to investigate the effect of psychological variables on attitudes towards using technology. This would make it easier to investigate the direct effect of independent variables on respondents' attitudes in regard to the acceptance and use of ICT at Universities.

As shown in Table 4.11, the overall **R2** score was 0.47 for the endogenous (dependent) variable ATUT. This indicates that the four psychological variables (*Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions*) as predictors account for 47% of the variance in informants' attitude towards using technology. Further, the analysis of variance results show that the overall regression model 1 for psychological variables as predictors of teachers' attitude towards using technology is statistically significant at p <0.01 level (F 4, 28 = 6.306).

Table 4.11: ANOVA for Predictors of Attitude Towards ICT Use

Description	Sum of Squares	df	Mean Square	F	R Square	Adjusted R Square	Sig.
Regression Model 1	5.977	4	1.494	6.306	.474	.399	.001[b]
Residual	6.634	28	.237				
Total	12.611	32					

Table 4.12: Regression Results for Predictors of Attitude Towards Using Technology

Regression Model 1	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	2.240	.754		2.971	.006
Performance Expectancy (PE)	.223	.098	.353	2.269	.031
Effort Expectancy (EE)	.239	.113	.379	2.120	.04?
Social Influence (SI)	.245	.172	.222	1.426	.165
Facilitating Conditions (FC)	-.222	.247	-.148	-.899	.376

a. Dependent Variable: Attitude Towards Using Technology (ATUT)

b. Predictors: (Constant), Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions

The results of regression analysis (Table 4.12) illustrate that Performance Expectancy (ß =.35, t=2.26, p <0.05) and Effort Expectancy (ß =.37, t=2.12, p <0.05)

have statistically significant moderate effects on teachers' attitude towards using technology. However, the results show that Social Influence and Facilitating Conditions have no significant influence in determining the *attitude of teachers towards using technology.*

Hence, the proposed hypothesis 2 for Performance Expectancy and Effort Expectancy as predictors of attitude towards using technology is accepted, while the proposed hypothesis for remaining two psychological variables: Social Influence and Facilitating Conditions as predictors of attitude towards ICT use is rejected.

Regression Model 2: Predictors of Behaviour Intention to Use ICT

The Second Step: Multiple regression analysis was conducted to determine the impact of the independent variables: (Performance Expectancy – Effort Expectancy – Social Influence – Facilitating Conditions and Attitude Towards Using Technology) on the intervening variable: Behavioural Intention (BI), as shown in Figure 4.2.
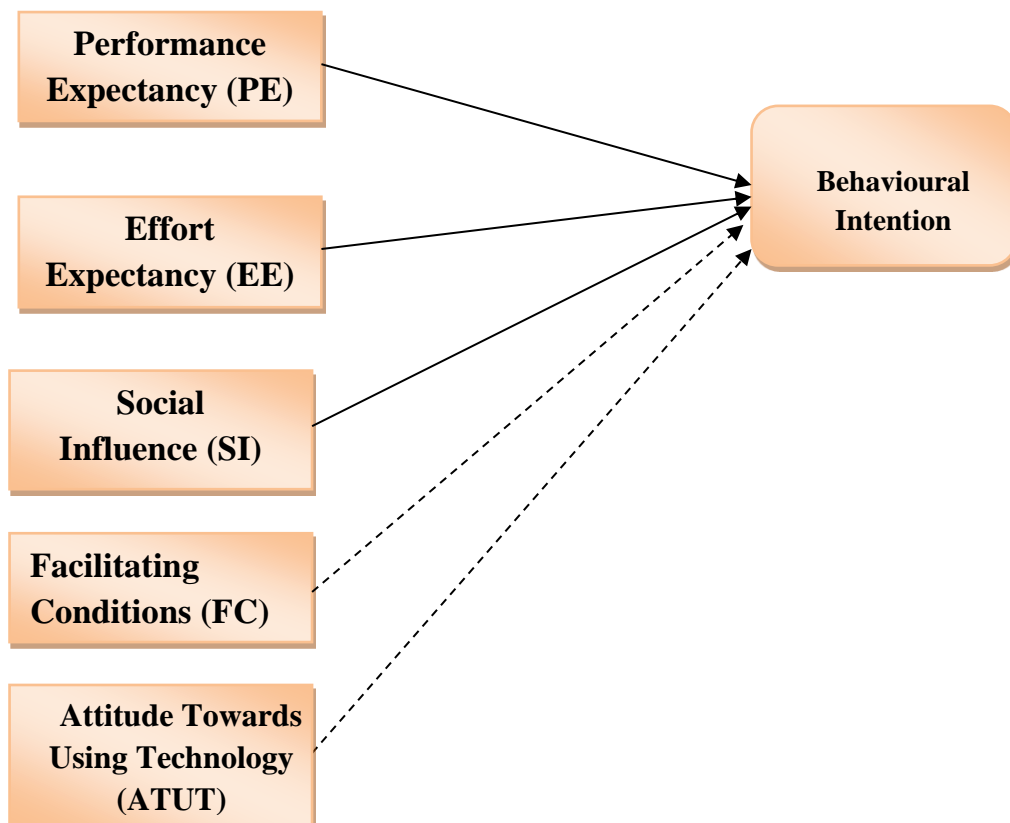
Figure 4.2 Research Model – (part 2)

Chapter Four: Data Analysis and Results

Hypothesis 3: Predictors of Behaviour Intention to Use ICT

There exists a significant contribution of predictor variables: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and Attitude Towards Using Technology **on the criterion variable: Behaviour Intention.**

Here, the regression analysis is carried out to investigate the direct influence of five independent variables as major determinants of behaviour intention of informants to use ICT in the future. The ANOVA results in Table 4.13 shows that the six psychological variables, namely, performance expectancy, effort expectancy, social influence, facilitating conditions and attitude towards using technology taken as a set explains 50% of variance (R^2=.50) in the behaviour intention of teachers to use ICT in the future.

Table 4.13: ANOVA for Predictors of Behaviour Intention

Description	Sum of Squares	df	Mean Square	F	R Square	Adjusted R Square	Sig.
Regression Model 2	7.420	5	1.484	5.332	.497	.404	.002[b]
Residual	7.515	27	.278				
Total	14.936	32					

Table 4.14: Multiple Regression Results for Predictors of Behaviour Intention

Regression Model-2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.558	.937		.595	.557
Performance Expectancy (PE)	.043	.116	.063	.373	.712
Effort Expectancy (EE)	.098	.132	.143	.743	.464
Social Influence (SI)	-.075	.193	-.062	-.388	.701
Facilitating Conditions (FC)	.331	.271	.203	1.223	.232
Attitude Towards Using Technology (ATUT)	.573	.205	.527	2.799	.009

a. Dependent Variable: Behavioural Intention to Use

b. Predictors: (Constant), Attitude Towards Using Technology, Facilitating Conditions, Social Influence, Performance Expectancy, Effort Expectancy

The ANOVA results confirm that the overall regression model for five independent psychological variables as predictors of teachers' behaviour intention to use ICT is statistically significant at p <0.05 level (F 5, 27 = 5.33).

As shown in Table 4.14, the findings revealed that *attitude towards using technology* is the only variable that has a substantial moderate influence (ß =.52, t=2.79, p <0.05). The Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions are found to have no significant influence in determining the teachers' behaviour intention to use ICT in the future. Hence, the proposed hypothesis 3 in respect of attitude towards using technology as a predictor of behaviour intention to use ICT is accepted. The hypothesis in respect of Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions as predictors of behaviour intention to use ICT is rejected. Therefore, the third hypothesis, about the effects of PE, EE, SI, FC, and ATUT on BI, was partially supported. Specifically, only ATUT factor positively and significantly influenced teachers' behavioural intention towards ICT.

Regression Model 3: Predictors of Actual Use of ICT

The Third Step: Regression analysis was conducted to determine the impact of the independent and mediating variables: (Facilitating Conditions – Behavioural Intention – Attitudes Toward Using Technology) on the dependent variable Use Behaviour, as shown in Figure 4.3.
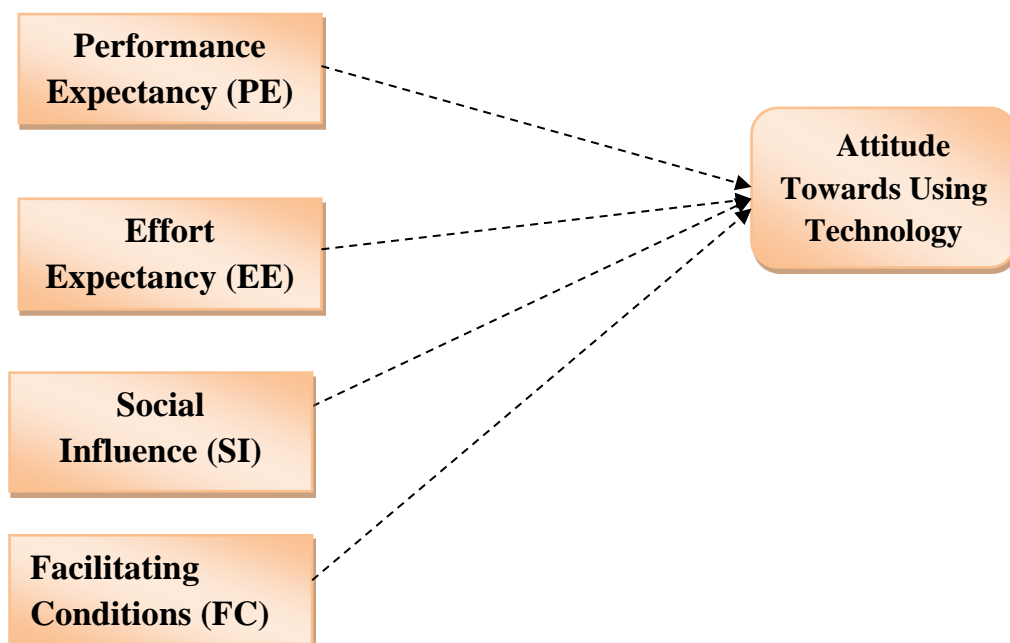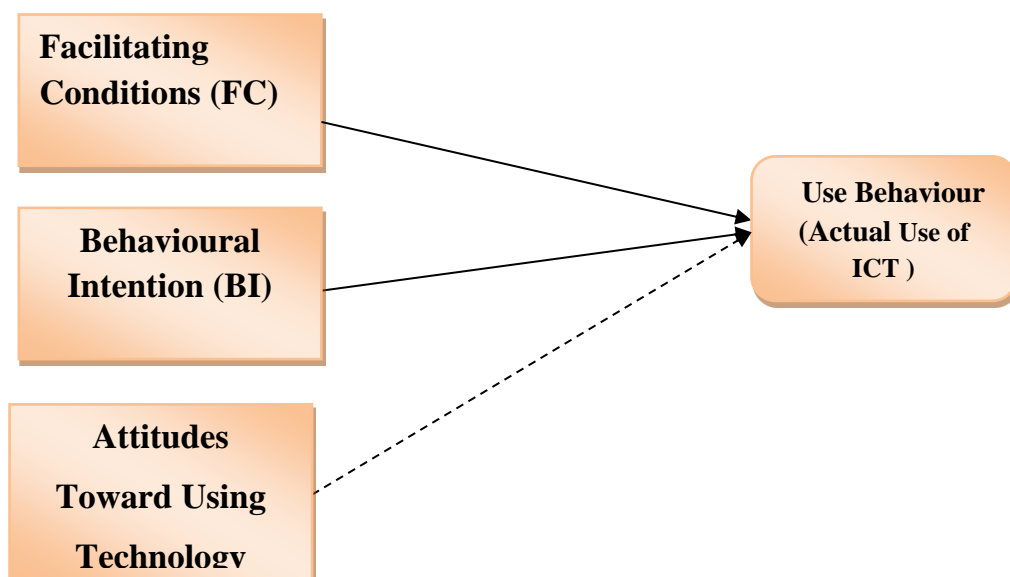

Figure 4.3 Research Model – (part 3)

Hypothesis 4: Predictors of Actual Use of ICT

There exists a significant contribution of predictor variables: Facilitating Conditions, Attitude Towards Using Technology and Behaviour Intention on the criterion variable: Actual Use of ICT.

Table 4.15 displays that the six psychological variables are able to explain 38.7% of variance in informants' actual use of ICT. The results of ANOVA show that the overall regression model 3 is statistically significant at $p < 0.01$ level ($F_{3, 29} = 6.10$).

Taken as a set, the three predictors Facilitating Conditions, Attitude Towards Using Technology and Behaviour Intention account for 38.7% of variance in informants' actual use of ICT (Table 4.15).

Table 4.16 gives the estimated values of the standardised regression coefficients as 'Beta' (ß) values that explain the proportion of variance contributed directly by each of the predictor variables. The proportion of variance explained in actual ICT usage is only moderate for Behavioural Intention to Use (ß =.41, t=2.06, $p < 0.05$) and Facilitating Conditions (ß =.34, t=2.23, $p < 0.05$). The effect of Attitude toward Using Technology (ß = -.011 t= -.05, $p > 0.05$) is negligible and statistically insignificant. Hence, Attitude Towards Using Technology has no significant influence on informants' actual use of ICT. Therefore, the regression model of Facilitating Conditions and Behavioural Intention on the dependent variable, teachers' Use Behaviour is a significant model which explains the changes that occur in teachers' use of Information Technologies.

Table 4.15: ANOVA for Predictors of Actual Use of ICT

Describtion	Sum of Squares	df	Mean Square	F	R Square	Adjusted R Square	Sig.
Regression Model 3	6.686	3	2.229	6.109	.387	.324	.002[b]
Residual	10.579	29	.365				
Total	17.265	32					

Table 4.16: Multiple Regression Results for Predictors of Actual Use of ICT

Regression Model 3	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.066	.985		.067	.947
Facilitating Conditions (FC)	.610	.273	.347	2.233	.033
Behavioural Intention to Use (BI)	.448	.217	.417	2.068	.048
Attitude Towards Using Technology (ATUT)	-.013	.224	-.011	-.056	.955

a. Dependent Variable: Actual Use of ICT (AUT)

b. Predictors: (Constant), Attitude Towards Using Technology, Facilitating Conditions, Behavioural Intention to Use

Therefore, the posited hypothesis 4 is tested and found accepted for Behavioural Intention to Use and Facilitating Conditions as major predictors of actual use of ICT. The hypothesis pertaining to Attitude Towards Using Technology as a predictor of actual use of ICT is rejected.

To summarise, the findings revealed that Behavioural Intention to Use has the most significant influence on the use behaviour to use Information Technology, followed by Facilitating Conditions, while the psychological construct of *Attitude Towards Using Technology* does not influence the behaviour to use Information Technology. The regression analyses show that the revised model of UTAUT in the current study explains 47% of variance in informants' attitude towards using technology, 50% of variance in intention to use, and 38.7% of variance in actual use of ICT. Therefore, the fourth hypothesis, concerning the effects of FC, ATUT and BI on USE, was partially supported. Specifically, it appears that only Facilitating Conditions and Behavioural Intention positively influenced teachers' use of Information Technologies to a level of statistical significance.

4.3.3 Differential Analysis with Moderator Variables

In this section, the differences in the mean scores for behavioural intention and actual use of ICT and for the five psychological variables across various socio-demographic characteristics of sample informants are analysed. In this regard, the researcher of the present research explains the associations between demographic characteristics and all seven factors: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Teachers 'Attitudes towards Using Technologies (ATUT), Facilitating Conditions (FC), Behavioural Intention (BI), and Use Behaviour (UB). The t-test is used for socio-demographic characteristics that are coded as dichotomous dummy variables, while analysis of variance (ANOVA) is used for socio-demographic characteristics that have more than two categories. Hence, the moderation hypotheses proposed in the study are tested using t-test and ANOVA and the results obtained are reported.

Hypothesis 5: Gender Difference

There is no significant difference between the mean scores of male and female teachers in their:

5.1) Performance Expectancy
5.2) Effort Expectancy
5.3) Social Influence
5.4) Facilitating Conditions
5.5) Attitude Towards Using Technology
5.6) Behaviour Intention
5.7) Actual Use of ICT

Table 4.17 presents the mean scores, standard deviation, t-value and p-value of male and female teachers for psychological variables and the behavioural intention of using ICT. It is found that the mean scores significantly differ ($p < 0.05$) between male and female teachers for Performance Expectancy. Gender differences are found in PE (t=-.77, p=0.003) with males (M=3.86) showing a significantly lower mean score compared to females (M=4.14). Hence, null hypothesis for overall construct of Performance Expectancy (H.5.1) is rejected.

The t-test reveals no significant difference in mean scores between male and female informants for the *Effort Expectancy* (ICT ease of use). It shows that both male and

female teachers believe the use of ICT as easy and less complex. Hence, null hypothesis for overall *Effort Expectancy* (H.5.2) is accepted at p 0.08.

No significant difference in the mean scores for social influence is noticed between male and female informants. It may be inferred that 'significant others' might have similar influence on male and female teachers' decision to use ICT at university. Hence, null hypothesis for the overall social influence (H.5.3) is accepted.

For facilitating conditions, there exists no significant difference in mean scores between male and female teachers leading to acceptance of the null hypothesis (H.5.4).

There exists no significant difference in the mean scores between male and female informants for overall attitude towards using technology. Hence, null hypothesis for overall attitude towards technology use is retained (H5.5), indicating that female and male teachers have positive attitude towards the use of technology. The mean score for intention to use ICT in future is found higher for females than males and the difference is statistically not significant at, indicating the acceptance of the null hypothesis (H.5.6).

Furthermore, the t-test reveals that the mean scores for actual use of ICT are found higher for females than males and the difference is statistically not significant, indicating the acceptance of the null hypothesis (H.5.7).

Table 4.17: t-Test for Significant Difference among Teachers by Gender

Variables	Male		Female		t	*p-value[1]*
	Mean	**SD**	**Mean**	**SD**		
Performance Expectancy	3.86	1.49	4.14	0.63	-.771	.003
Effort Expectancy	3.52	1.35	3.69	0.79	-.458	.081
Social Influence	3.5273	0.41	3.33	0.63	.904	.447
Facilitating Conditions	3.0182	0.32	3.10	0.46	-.524	.154
Attitude Towards Using Technology	4.0152	0.73	4.24	0.56	-.980	.472
Behaviour Intention	3.93	.814	4.39	.565	-1.923	.56
Actual Use of ICT	3.75	.487	3.80	.841	-.206	.06

[1]p-value corresponding to the independent samples t-test

Hypothesis 6: Age

There is no significant difference among the mean scores of teachers with respect to age and

    6.1) Performance Expectancy
    6.2) Effort Expectancy
    6.3) Social Influence
    6.4) Facilitating Conditions
    6.5) Attitude Towards Using Technology

A one-way between-groups analysis of variance (ANOVA) is used to explore the impact of informants' age on independent and dependent variables. For the purpose of analysis, informants are divided into five age groups: (i) age group 1:18 to 25years; (ii) age group 2:26 to 35 years; (iii) age group 3:36 – 45 years ;(iii) age group 4:46 – 55 years; and (iiii) age group 5:56 – 65 years.

Table 4.18 presents the mean scores, F-value and *p*-value of teachers by their age group for psychological variables and actual use of ICT.

Table 4.18: ANOVA for Significant Difference among Teachers by their Age Groups

Variables	Mean					F	*p-value[1]*
	Younger Age		Middle Age		Older Age		
	18-25 years	26-35 years	36-45 years	46-55 years	56-65 years		
Performance Expectancy	4.25	3.88	4.22	3.33	4.75	1.097	.377
Effort Expectancy	4.50	3.58	3.30	4.25	3.68	.915	.469
Social Influence	3.20	3.33	3.33	3.53	3.80	.647	.634
Facilitating Conditions	3.50	3.10	2.95	3.13	2.95	.807	.531
Attitude Towards Using Technology	4.25	4.22	4.03	4.00	4.33	.233	.918
Behaviour Intention	5.00	4.21	4.08	4.25	4.31	.727	.581
Actual Use of ICT	3.75	3.73	3.69	4.00	4.06	.236	.916

[1]p-value corresponding to the one-way ANOVA

As we can see from the above table, for Performance Expectancy, the mean values for older aged teachers are found to be higher as compared to teachers in the younger and middle age groups. The post-hoc comparisons using the ANOVA test revealed that the mean values of older aged teachers significantly differ from the teachers in younger and middle age groups for overall ICT usefulness and for teaching practices advantage. It shows that the older age group teachers felt the usefulness of ICT and its educational advantage more than the younger and middle age groups. Hence, null hypothesis for overall Performance Expectancy (H.6.1) is rejected.

The ANOVA results establish no significant difference in the mean scores for Effort Expectancy (ICT ease of use) across teachers' age. It may be inferred that irrespective of age, all the informants believe that ICTs are easy to use and are 'less complex'. Hence, the null hypothesis (H.6.2) is accepted.

The ANOVA results show that there is no significant difference in the mean scores of informants for social influence, facilitating conditions, attitude towards using technology, behaviour intention and actual use of ICT across age groups. Hence, null hypotheses from H.6.3 to H.6.7 are accepted.

Hypothesis 7: Teaching Experience

There is no significant difference among the mean scores of teachers with respect to years of teaching experience and

7.1) Performance Expectancy

7.2) Effort Expectancy

7.3) Social Influence

7.4) Facilitating Conditions

7.5) Attitude Towards Using Technology

7.6) Behaviour Intention

7.7) Actual Use of ICT

A one-way between-groups analysis of variance (ANOVA) is carried out to analyse the difference in mean scores of independent and dependent variables across the years of teaching experience where the teachers are working.

For the purpose of analysis, the years of teaching experience among the informants were divided into three groups: (i) low: <10 years; (ii) medium: 11–20 years and (iii)

high: 21+years of teaching experience. Table 4.19 presents the mean scores, F-value and *p*-value of teachers by their years of teaching experience with respect to independent and dependent variables.

It is important to note that consistently for most of the study variables there exists no significant difference in mean values of informants by their years of teaching experience.

It is found that the mean values of respondents with years of teaching experience do not significantly differ for Performance Expectancy, Effort Expectancy, Social Influence, Attitude Towards Using Technology, Behaviour Intention and Actual Use of ICT. The null hypotheses from $H_0.7.1$ to $H_0.7.3$ and from $H_0.7.6$ to $H_0.7.7$ are found accepted.

Table 4.19: ANOVA for Significant Difference among Teachers by their Teaching Experience

Variables	Mean						F	p-value[1]
	Low		Medium		High			
	1-5 years	6-10 years	11-15 years	16-20 years	21-25 years	26 years +		
Performance Expectancy	3.80	4.00	4.25	5.00	2.50	4.75	2.290	0.74
Effort Expectancy	3.61	3.65	3.08	5.00	3.878	3.68	1.183	.343
Social Influence	3.13	3.52	3.13	4.00	3.40	3.80	1.773	.152
Facilitating Conditions	3.31	3.02	2.76	3.60	2.90	2.95	2.520	.045
Attitude Towards Using Technology	4.22	4.06	4.13	4.50	3.83	4.33	.312	.029
Behaviour Intention	4.36	4.15	4.04	5.00	3.87	4.31	.783	.571
Actual Use of ICT	3.72	3.75	3.45	4.75	3.75	4.06	1.072	.397

[1]p-value corresponding to the one-way ANOVA

Different trend is observed for facilitating conditions, attitude towards using technology. It clearly shows that the informants with more years of teaching experience

have more favourable opinion towards use of ICT. The null hypotheses $H_0.7.4$ and $H_0.7.5$ are found rejected.

Regarding the moderated interaction effects, gender, age and experience negatively affected the relationship between EE, SI and BI to a level of non-significance. Gender and age positively moderated the effects of PE and BI. Experience positively impacted on the relationship between FC, ATUT and BI. Therefore, the fifth, sixth and seventh hypotheses, assuming the moderated effects of gender, age and teaching experience on the relationship among constructs, were partially accepted. Specifically, gender, age, and teaching experience displayed specific moderating effects on the relationship between Performance Expectancy, Facilitating Conditions, Attitude toward Using Technology and Behavioural Intention.

4.4. Areas Needing Additional Investigation

Based on the findings of the questionnaire in Phase One of the study, a number of areas came to the fore requiring a further investigation. Qualitative research can be valuable when tabulations obtained from questionnaire responses reveal interesting patterns that require greater explanation and more additional information by delving deeper into the lived experiences of the responding interviewees.

Despite the fact that the questionnaire gave a description of behaviour and attitudes, there were times when further information was needed to explain these responses. Each section of the questionnaire results was carefully examined to determine if there were any issues that may be addressed further when conducting semi-structured interviews with questionnaire informants.

It was felt that it would be useful to ascertain what sort of technology equipments were available at the level of the University and the extent to which the availability of educational tools was felt to be effective and made use for the teaching process by informants. Given that informants had been asked to select the available technological equipments in their current practice. Specifically, underuse of the Algerian Moodle LMS Platform was felt to need more explanation.

Following on from these concerns, there was a need to go deeper into the actual working experiences of these teachers in terms of time constraints, a lack of resources, lack of training and professional opportunities, and a lack of support to determine what

role these factors play in their inability to use or underuse technological tools. The relationship between the availability and efficiency of digital equipment that Algerian Higher Education teachers have at home and their use of ICT at University was also highlighted as being worth further investigation, for example, to see if some teachers had developed strategies to deal with poor facilitating conditions in their institutions and to learn what improvements they would welcome.

In terms of social influence, further enquiry was needed into how University administrators and teachers' colleagues regard the use of ICT, as well as teachers' attitudes, particularly to identify what obstacles that hinder the adoption of Information Technologies. More information is needed about the resistance to using specific technological tools and the need for additional training.

The findings of the quantitative questionnaire revealed that the Algerian teachers frequently used Information Technology and had positive experiences regarding this technology in general. Consequently, these results showed that a high proportion of teachers were more experienced in using technology and were better able to use this in their teaching practices to create new learning experiences for their students. Finally, further details of teachers' attitudes and knowledge about the Ministry of Higher Education policy for the use of technological tools are required.

An open-ended question was also used at the end of the questionnaire to enquire about the points teachers would consider as encouraging and discouraging factors for using ICT in teaching practices and will be tackled fully and integrated with the qualitative data analysis in the second part of this chapter.

4.5. Summary of the Quantitative Findings

The first section of this chapter has presented the analysis of the quantitative data collected during Phase One of this study. In this phase, the data were collected by an eight-part, self-report online questionnaire from 33 Algerian Higher Education EFL teachers employed in the Department of English at Hassiba Benbouali University of Chlef during the Academic Year of 2020–2021.

The findings of the survey questionnaire showed some interesting information about the acceptance and use of ICT in the Algerian Higher Education Institutions. In general, survey respondents in the sample were enthusiastic and exhibited positive attitudes

toward using technological tools in their classroom teaching practices, believing that ICT enhanced their performance and was also very simple to adopt. When asked how their significant others felt about their use of Information Technology, there were diverse responses, but the overall impression was good. Despite the fact that supporting conditions in the Algerian Higher Education are obviously insufficient, the majority of informants identified digital technologies as something they wanted to incorporate into their teaching practices especially with ongoing spread of COVID-19 pandemic, and a significant number were already using their computer laptops, wall-mounted Data Show, and PowerPoint.

The overall mean score for each of the six psychological variables ranged between 3.40 and 4.24 indicating teachers' favourable belief and perception toward the use of ICT for teaching and learning process in Higher Education Institutions. However, in case of Facilitating Conditions the overall mean of 3.07 indicates a medium level of support available at University to use ICT.

The correlations between the various factors that can influence the acceptance and use of Information Technology were identified, revealing that there are strong correlations between several factors and behavioural intention to use these technologies as well as actual use. These findings uncovered a number of areas that were studied further in the qualitative phase of the research, through the conduct of semi-structured interviews, with a sample of questionnaire informants, which is the subject of the second part of this chapter.

Based on the research hypotheses, the regression and moderation analysis examined the key determinants that influence the behavioural intention to use Information Technology using the revised UTAUT model. The findings revealed that *Attitudes toward Using Technology* is the only variable that has the most significant impact on Behavioural Intention to use ICT in teaching practice**s**, while Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions do not influence the Behavioural Intention to use ICT. Secondly, the key determinants that influence the behaviour to use ICT were examined using the UTAUT model. The findings showed that Behavioural Intention to Use and Facilitating Conditions have the most significant

influence on the use behaviour to use ICT in teaching practice. Meanwhile, *Attitude toward Using Technology* does not influence the behaviour to use ICT.

The gender of the teachers moderated the relationship between Performance Expectancy, and Behavioural Intention to use ICT among teachers. Age also moderated the relationship between Performance Expectancy and the Use Behaviour of Information Technologies among the teachers, where the older age group teachers felt the usefulness of ICT and its educational advantage more than the younger and middle age groups. Experience also moderated the relationship between *Attitude toward Using Technology* and Behavioural Intention to use Information Technologies among the teachers, where the informants with more years of teaching experience have more favourable opinion toward use of ICT. Experience also moderated the relationship between Facilitating Conditions and Use Behaviour. The results of the research hypotheses are presented in Table 4.20.

Table 4.20: The Results of Hypotheses Testing

Hypothesis	Result	Conclusion
Hypothesis 1: Relationship among Independent and Dependent Variables		
There is a significant relationship between Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Towards Using Technology, Behaviour Intention and Actual Use of ICT among teachers.	All the six psychological variables (**PE, EE, SI, FC, ATUT, BI**) and the actual use of ICT are moderately correlated.	(accepted)
Hypothesis 2: Predictors of Attitude Towards ICT Use		
H2.1 Performance Expectancy influences teachers' Attitudes towards Using Technology.	**PE→ATUT** is significant (p<0.05).	(accepted)
H2.2 Effort Expectancy influences teachers' Attitudes Towards Using Technology.	**EE→ ATUT** is significant (p<0.05).	(accepted)
H2.3 Social Influence influences teachers' Attitudes Towards Using Technology.	**SI→ATUT** is not significant.	(rejected)
		(rejected)

2.4 Facilitating Conditions influence teachers' Attitudes Towards Using Technology.	FC→**ATUT** is not significant.	
Hypothesis 3: Predictors of Behaviour Intention to Use ICT		
H3.1 Performance expectancy influences teachers' behavioural intention to use Information Technology.	**PE→BI** is not significant.	(rejected)
H3.2 Effort expectancy influences teachers' behavioural intention to use Information Technology.	**EE→BI** is not significant.	(rejected)
H3.3 Social Influence influences teachers' behavioural intention to use Information Technology.	**SI→BI** is not significant.	(rejected)
3.4 Facilitating Conditions influence teachers' behavioural intention to use Information Technology.	**FC→ BI** is not significant.	(rejected)
H3.5 Attitude Towards Using Technology influences teachers' behavioural intention to use Information Technology.	**ATUT→ BI** is significant. ($p < 0.05$).	(accepted)
Hypothesis 4: Predictors of Actual Use of ICT		
H4.1 Facilitating conditions influence teachers' actual use of ICT.	**FC→AUT** is significant ($p < 0.05$).	(accepted)
H4.2 Behavioural Intention influences teachers' actual use of ICT.	**BI→AUT** is significant ($p < 0.05$).	(accepted)
H4.3 Teachers' attitude towards using technology influences actual use of ICT.	**BI→AUT** is not significant ($p < 0.05$).	(rejected)
Hypothesis 5: Gender Difference		
There is no significant difference between the mean scores of male and female teachers in their: 5.1) Performance Expectancy 5.2) Effort Expectancy 5.3) Social Influence: 5.4) Facilitating Conditions 5.5) Attitude Towards Using Technology 5.6) Behaviour Intention 5.7) Actual Use of ICT	There is a significant difference between the mean scores of male and female There is no significant difference between the mean scores of male and female	($H_0.5.1$) is rejected. The null hypotheses ($H_0.5.2$). ($H_0.5.3$) ($H_0.5.4$) ($H_0.5.5$) ($H_0.5.6$) ($H_0.5.7$) are accepted.

Hypothesis 6: Age		
There is no significant difference among the mean scores of teachers with respect to age and 6.1) Performance Expectancy 6.2) Effort Expectancy 6.3) Social Influence 6.4) Facilitating Conditions 6.5) Attitude Towards Using Technology		($H_0.6.1$) is rejected The other null hypotheses ($H_0.6.2$), ($H_0.6.3$), ($H_0.6.4$), ($H_0.6.5$), and ($H_0.6.6$) are accepted
Hypothesis 7: Teaching Experience		
There is no significant difference among the mean scores of teachers with respect to years of teaching experience and 7.1) Performance Expectancy 7.2) Effort Expectancy 7.3) Social Influence 7.4) Facilitating Conditions 7.5) Attitude Towards Using Technology 7.6) Behaviour Intention 7.7) Actual Use of ICT		($H_0.7.1$) is accepted ($H_0.7.2$) is accepted ($H_0.7.3$) is accepted ($H_0.7.4$) is rejected ($H_0.7.5$) is rejected ($H_0.7.6$) is accepted

As mentioned in Chapter 3, the acceptance and use of ICT were also investigated using qualitative semi-structured interviews with Algerian EFL teachers at Hassiba Benbouali University of Chlef to provide an in-depth understanding, particularly in responding to the two main research questions that seek to better understand ''what'' and ''how'' Algerian Higher Education EFL teachers need to use ICT effectively into their classroom teaching practices by using the revised model of UTAUT. The next section of this chapter presents the qualitative analysis of the interviews findings.

Section Two: Qualitative Data Analysis and Findings

4.6. Introduction and Thematic Analysis of the Qualitative Data

Six University EFL teachers who had consented to be interviewed at the end of the questionnaire in the First Phase of the study were interviewed in semi-structured interviews. The interviews with all of the male and male teachers were carried out face-to-face and tape-recorded at their convenience. The researcher ensured that all of the informants were available for the interview and put them at ease.

In this second phase of the present study, the collected data are presented in the form of a narrative because the research tool used was the semi-structured interview which depends on open-ended questions. Because of the nature of the data collected, the researcher used MAXQDA software for quantitative data analysis. Thematic analysis, as explained in Chapter 3 (see Section 3.8.2.2), is the most appropriate method for analysing narrative data. The data obtained in Phase 2 of the investigation needed to be reduced so that the researcher could properly analyse it by extracting the key points that would answer the research questions and shed more light on the issues surrounding Algerian Higher Education teachers' acceptance and use of technology. The researcher used both deductive and inductive analysis to create summary sheets for each of the six interviews conducted to see what points each teacher made in relation to each factor in the revised UTAUT model as well as other points that addressed issues relevant to the Algerian Higher Education context. These points were converted to codes, which were then analysed using the MAXQDA coding programme. The codes were grouped into themes and sub-themes that are shown throughout this second section of this chapter to demonstrate each major theme.

To ensure complete anonymity, the teachers who were questioned were assigned numbers (T1 – T6) in MAXQDA. The answers to the questions have been categorised (see table 4.6); however, when replies appeared to be related to other factors, this was highlighted. The evaluation of any changes in interviewees' attitudes, as well as whether certain opinions appeared to recur, will be part of the discussion of the findings.

In this current study, the semi-structured interviews sought to address the following research questions:

RQ 1: What are the factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education Institutions (AHEIs) specifically at the University of Chlef?

Thus, this question devolves into a number of ensuing questions that need to be investigated through primary research, as follows:

➢ To what extent (if any) do independent variables (EE, PE, SI, and FC) affect teachers' attitudes toward using technology at HEIs?

➢ To what extent (if any) do independent variables Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Teacher Attitudes toward Using Technology (ATAUT) affect teachers' behavioural intentions to use ICT at AHEIs?

➢ To what extent (if any) do EE, PE, SI, FC, ATAUT and behavioural intention (BI) explain variances in the use of ICT at HEIs?

RQ 2: How do teachers' socio-demographic variables moderate the effects of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes Toward Using Technology on teachers' intention to use ICT?

RQ 3: How can the Unified Theory of Acceptance and Use of Technology (UTAUT) model be used to better understand what Algerian Higher Education teachers perceive they need to effectively use ICT?

The research questions were codified and broken down into a number of categories (see Table 4.21) and the interviews structured accordingly. (The Interview Schedule is presented in Appendix E).

Overall, this qualitative phase of the present study complements and affirms the quantitative component in the previous part. The qualitative analysis presented here is used in the service of qualitative analysis to follow up for further clarification of the results obtained from the survey questionnaire and also as a tool used for data

triangulation purposes. It aids the interpretation and confirms the results of the survey findings. The goal of the qualitative study is to bring up issues related to the topic but which had not been covered in the questionnaire. It also aims to elaborate deeply on the influence of the constructs of the Unified Theory of Technology Acceptance (UTAUT) on teachers' usage of Information and Communication Technology (ICT) to highlight new emerging themes or issues that might be of interest from the findings of the survey data.

Table 4.21 Topics, Codes and Categories

Topics	Codes	Categories
1.The factors that influence the use of technology in the Algerian Higher Education	FTE	-Performance Expectancy -Effort Expectancy - Social Influence -Facilitating Conditions -Attitude toward Using Technology -Behavioural Intention - Actual Use
2. The influence of the revised Unified Theory of Acceptance and Use of Technology (UTAUT) to the Use of ICT in the Algerian Higher Education	U	-Teachers' perspectives and viewpoints on the UTAUT

A qualitative approach was used in this study to deepen the understanding of the quantitative results in accordance with the proposed research model presented in Figure 1.12 in Chapter 1. An individual semi-structured interview process was developed. A profile of the six EFL teachers who were interviewed face-to-face in order to collect this qualitative data, with their demographic details is presented in Table 4.22 below. There were four male and two female informants. Their work experience ranged from two to twenty-six years.

Table 4.22 Informant Profile for the Semi-structured Interviews (N° 6)

Code	Gender	Age Range	Work Experience
Teacher 1 (Interviewee 1)	Female	26-35	6-10 Years
Teacher 2 (Interviewee 2)	Male	56-65	26 + Years
Teacher 3 (Interviewee 3)	Male	26-35	1-5 Years
Teacher 4 (Interviewee 4)	Male	46-55	21-25 Years
Teacher 5 (Interviewee 5)	Female	18-25	1-5 Years
Teacher 6 (Interviewee 6)	Male	26-35	11-15 Years

- **Themes**

The researcher of the current study analysed the codes that arose from the transcripts' thematic analysis, and twenty-five sub-themes were discovered. Based on the available interview data, they were analysed and re-examined, with twenty-one subthemes being kept in this empirical study and four subthemes being deleted due to a lack of representation in the interview transcriptions. The themes were then found to fit and correspond to the constructs of the modified UTAUT model. Therefore, seven (07) themes emerged from the revised model in accordance the number of variables of the study. In addition, the data-derived themes were recategorised as subthemes. The themes and subthemes that came to the fore during the qualitative analysis are displayed in Table 4.23 below, and the accompanying codes are listed in Appendix F.

Table 4.23: Themes and Sub-Themes Emerging from the Qualitative Analysis

Themes		Sub-Themes
1.	Performance Expectancy	**1.** Application Use **2.** Usefulness **3.** Productivity
2.	Effort Expectancy	**4.** Ease of Use **5.** Time Management **6.** Flexibility and Accessibility
3.	Social Influence	**7.** Encouragement from others **8.** Support
4.	Facilitating Conditions	**9.** Internet connection **10.** Training and knowledge **11.** The Number of Students
5.	Attitude Toward Using Technology	**12.** Enjoyment **13.** Motivation
6.	Behavioural Intention	**14.** Intention and Readiness **15.** Willingness
7.	Use Behaviour	**16.** Reluctance **17.** The Use of Pedagogical

		Platform of Moodle LMS
8.	**Barriers to ICT Acceptance and Use**	**18.** Lack of Training and Budget **19.** Weak Internet Connection **20.** Lack of Knowledge of ICTs **21.** Lack of Technical Support

The next section highlights the themes and sub-themes influencing the acceptance of Information Technology among the Algerian Higher Education teachers, as obtained from the thematic analysis of the qualitative data.

4.7. Emerging Themes of the Factors that Influence the Acceptance and Use of ICT in the Algerian Higher Education

The responding teachers were asked specific questions regarding each of the factors in the modified UTAUT model in order to elicit details not only whether or not they were important in their acceptance or rejection of ICT, but how and why they were.

4.7.1 Performance Expectancy

The Performance Expectancy construct is described in the theoretical framework as 'the degree to which an individual believes that using the system will assist him or her in achieving gains in job performance' (Venkatesh et al., 2003, p. 447). According to the proposed research model, Performance Expectancy is the degree to which some Algerian University teachers believe that using Information Technology would help them perform their teaching tasks more effectively. Hence, the informants in the face-to-face semi-structured interviews were asked about the advantages of incorporating ICTs into the teaching and learning processes, as well as whether they considered these technologies contributed to better learning and teaching process. From the qualitative data, three sub-themes emerged: *application use*, *productivity*, and *usefulness*.

Application Use

Application use refers to how an informant found ICT to be effective in their teaching activities through the use of various apps. During the interviews, most of the informants stated that the applications they used had a good impact on their perspectives on using Information Technology to teach English as a Foreign Language. For instance, an informant said,'

> *'I believe that just using PowerPoint, for example, or data shows or videos or audios attracts the interest of the learner more gradually, then the teacher himself speaking or explaining.'* (Interviewee 3)

One informant's response referred to Performance Expectancy in terms of how using the application may detrimentally influence the teachers' views on ICT, and in the context of new software, the informant stated that:

> *'Maybe there's an application or I don't know, software that I don't really know how to use it. So they may add something to my knowledge, I may get information, how to use it, or so on. For instance, in the module of oral expression we use the computer. We use the speakers, so students are likely to hear better because sometimes one time I used just the PC or just the phone, but the result was so bad. So when using the speakers, the task of the oral expression is so very easy.'* (Interviewee 5)

Productivity

One informant suggested that ICT increased productivity among students through the adoption of Information Technology in EFL classrooms, for example:

> *'Students sometimes need to use their smartphones for example for checking a certain word that is too difficult for them that the teacher ignores or didn't explain it or the teacher himself need to explain something in relation to the Module or subject he is dealing with.'* (Interviewee 6)

Usefulness

The term 'usefulness' refers to how responding informants found ICTs to be beneficial in their classroom teaching practises. The vast majority of teachers agree that using Information Technologies has advantages, and that they make teaching and learning easier by assisting teachers in course planning, reducing preparation time, and explaining syllabus items. Hence, the informants acknowledged the usefulness of ICTs in their teaching activities, mentioning a variety of reasons for why ICTs are beneficial to their teaching, such as:

> *'It is an absolute fact that ICT or ICTs, Information Technology, or Information Communication Technologies help greatly teachers in different ways. When you use for example, technological devices such as data show or projectors or something like that. It, let's say, eases access to the information.'* (Interviewee 6)

Another informant said:

> *'I think that ICTs are very important in the process of teaching because they facilitate the task of teaching for example, when using the pictures through the data show in general. So here we are saving time. Students here is following with you in like he's seeing the slides and he is listening to your explanation at the same time, you can also facilitate the task of explanation with images and sounds and so on.'* (Interviewee 5)

This comment highlights the benefits of technological tools as safer options as well as their positive pedagogic effect, which was also echoed by another interviewee who stated that:

> *'ICT facilitates the process. It makes me more comfortable it's also good for the students. Sometimes they do not understand especially it since English is a foreign language to them. And especially for those who are a new first-year students etc. Sometimes they cannot understand the pronunciation of particular words. And when you show them on the screen, what is written and you don't have to write them. we are saving time. And the second thing you are making sure that the students are understanding every single detail you are saying.'* (Interviewee 1)

In a similar vein, an informant expressed that:

> *'ICTs are very beneficial in regard to the explanation of the lesson items, using ICTs can facilitate the tasks of explanation and make things easy and clear for learners and for students.'* (Interviewee 4)

Another informant went further by explaining the various advantages of using ICT in their teaching practices.

> *'I think that ICTs play a very significant role in delivering a very, let's say, valuable and comprehensible course, especially for Foreign Language Teaching classes. It facilitates the course, especially that students are numerous, the teacher cannot deliver everything so ICT, especially the use of data show. Here the teacher can pay attention to every single detail without forgetting anything.'* (Interviewee 1)

Further, one informant said:

> *'I think I find ICT beneficial in terms of adding and filling some gaps.'* (Interviewee 5)

Performance Expectancy is also proven to have a highly substantial correlation with intention to use in the survey questionnaire, and the results of the semi-structured interviews mirror the survey replies. The results of the interviews provide insight on

why this is such an important factor and what aspects of ICT are valued by Algerian University teachers.

4.7.2 Effort Expectancy

The Effort Expectancy construct in the theoretical framework is the degree of ease associated with the use of technology (Venkatesh, Morris, Davis, Davis 2003). According to the proposed study model, Effort Expectancy indicates that the Algerian Higher Education teachers are more likely to adopt Information Technology if the technological tools are simple to use in everyday life. It is expected that acceptance and continual use of ICT will depend on whether teachers perceive the ICT as easy to use and free of effort.

Informants were asked questions on their perceptions of how easy or difficult it is for them to use technology, as well as finding out if they believe they require more time, effort, or skills to do so efficiently. This theme involves three sub-themes derived from the qualitative data: *ease of use*, *time management*, *flexibility and accessibility*.

Ease of Use

The majority of informants said that teaching with ICT is simple, and that this has influenced their decision to use it in their daily and academic lives. One informant, for example, noticed:

> *'The traditional teaching ways were time consuming and what the teacher makes, let's say, effort to transmit knowledge to the listeners who are the students, but now thanks to ICTs everything is becoming easier, smooth, and flexible.'* (Interviewee 6)

It is assumed that ICT offers several opportunities for communication between teacher and learners. For the teacher, ICT acts as a model of delivering speech. As one informant said:

> *'Yeah, it helps the teacher to gain time to moderate his lessons and to offer so many opportunities for both students and teachers to do the job easily.'* (Interviewee 2)

Some of the informants were a little less confident than the others, but they still thought the learning process was straightforward. One person thought that Information Technology would not be simple for people who are not used to it:

> *'We find some difficulties because technology is not available especially in the Algerian classrooms. That is to say, the teacher has to provide himself or herself with his or her special equipments.'* (Interviewee 2)

Time Management

Most of the responding informants said that ICT helped them manage their teaching time, for example:

> *'According to my experience, ICTs helped me a lot in managing my time and saving some time to make extra effort to my students'* (Interviewee 1)

It is claimed that the use of technology facilitates the teaching and learning process for both teachers and students, and it allows for quick transmission of information from teacher to students both inside and outside the classroom, which is the most essential reason for using ICT due to the limited time available during the teaching day. Another informant stated:

> *'ICTs help teachers to gain a lot time and efforts, and better enhance teachers' performance, as well as learners, even students'* (Interviewee 6)

Another informant remarked:

> *'Part of teachers' classroom courses are performed through ICTs, and that they are very beneficial because with regard to effort and the time spent, ICTs can help teachers to save time and effort'* (Interviewee 4)

Further, one informant stated:

> *'And by using technology, we get time we gain time'* (Interviewee 2)

Two informants, however, expressed a different viewpoint, claiming that technology did not help in managing their study time, and that implementing Information Technology required spending more time on managing and monitoring their students. As one interviewee put it:

> *'But we do not have enough time to use technology.'* (Interviewee 4)

Whilst another explained:

> *'Preparing courses based on ICT takes a long time while teachers are busy in the management of their time due to other responsibilities.'* (Interviewee 4)

Flexibility and Accessibility

All the informants stated that one of the most appealing features of using technology is its flexibility, mobility, highlighting how important this feature is in motivating them to adopt Information Technology, with one informant describing how:

> *'Thanks to ICTs everything is becoming easier, smooth, and flexible.'* (Interviewee 6)

Many interviewees, namely the survey informants, believed that educational technologies were simple to use, but they lacked the necessary skills to do so effectively. Educational technologies could be time-consuming due to a lack of skills and experience, which was aggravated by insufficient facilitating conditions.

4.7.3 Social Influence

The Social Influence construct of the theoretical framework in the current study refers to how much EFL believe important others, such as family, colleagues and friends, think they should use a specific technology (Venkatesh et al., 2003). According to the suggested research model, Social Influence is defined as the degree to which the Algerian Higher Education teachers perceive that important others believe they should or should not use ICT in teaching EFL. Hence, teachers were interviewed to find out who (if anyone) influenced their use of educational technology and how they regarded others' attitudes about it. Thus, the theme of social influence involves two sub-themes: *encouragement* and *support*.

Encouragement

When asked about Social Influence, all of the informants stated reasons that either encouraged or discouraged them from using Information Technology in their classrooms, and when asked about their viewpoints on it, they expressed a wide range of opinions. For example, three individuals highlighted self-encouragement as a major factor in their adoption of Information Technology:

> *'In this digital age and even when everyone everywhere you will find people using ICTs whether the students, learners, businessman and everything has become more and more digital so there is no other way to escape. So just go rely on yourself to learn more about ICTs that's it' (Interviewee 4)*

The informants reported how the characteristics of technology are the major encouraging factors in their use of ICT, for example:

> *'ICT makes me more comfortable it's also good for the students. Sometimes they do not understand especially it since English is a foreign language to them. And especially for those who are new first-year students, etc. Sometimes they cannot understand the pronunciation of particular words. And when you show them on the screen, what is written and you don't have to write them here, we are saving time. And the second thing you are making sure that the students are understanding every single detail you are saying.'* (Interviewee 1)

Two informants reported insufficient encouragement from their Universities. For example:

> *'I don't think there is enough support or encouragement by the administration for the use of ICT in the teaching'* (Interviewee 2)

Another informant said:

> *'There's less motivation to use ICT from the part of the administration staff'* (Interviewee 4)

While another informant related how:

> *'Teaching team greatly inspired me for using technology in the teaching process'* (Interviewee 3)

Competition and collaboration among teachers encouraged them to use the technology efficiently in their teaching practices especially with the outbreak of COVID-19 pandemic.

Support

Most of the interviewees indicated they were provided with insufficient support to use ICT during their teaching practices. As one of the informants mentioned:

> *'There is no technical support in at least, as I know, in the Faculty of Foreign Languages. Why? I'm here since 2019, I have never seen something called technical assistance or technical support. This is the point.'* (Interviewee 6)

On the flip side, an informant stated,

> *'Sometimes we want to face a technical problem for example with the data show or where the computer does not work properly. So there is help.'* (Interviewee 5)

And finally, one teacher who believed that they were much influenced by their colleagues commented,

> *' ... competition among teachers encouraged me to use the technology'*

Elsewhere, one of the interviewees mentioned:

'Using some more sophisticated software, this needs more training and more support. And in that situation particular things will become more difficult and needs support of other experts in ICTs.' (Interviewee 4)

Moreover, the surrounding environment plays a prominent role in influencing the responding teachers for using ICT in their teaching practices. As one informant astonishingly expressed his own experience of using ICT while he was abroad:

'To be honest, I mean, we have the chance to go abroad for one-year scholarship in England, and when arriving there we have discovered that there is a big, big huge gap between what's happening in Algeria in terms of ICT use, and how people are using ICT in an effective way there in England. There we were shocked that people do everything with ICTs. And we're still dealing with our ancient traditional ways in teaching. So it's only arriving there that we know is that we should rely on ICTs. And we are late compared to those people.' (Interviewee 4)

4.7.4 Facilitating Conditions

The Facilitating Conditions construct of the theoretical framework refers to teachers' perceptions of the resources and support available to perform a behaviour (Venkatesh et al., 2003). According to the proposed study model, Facilitating Conditions indicate that the Algerian Higher Education teachers will be more motivated to use technological devices for teaching if they believe the organisational and technological infrastructure exist to facilitate technology in teaching and knowledge exchange.

It was deemed necessary to explore further the extent to which the Algerian Higher Education's supporting conditions are ready to use ICT efficiently. Teachers were thus questioned about the resources accessible in their Institutions, as well as the available digital resources for the curriculum. Furthermore, this section presents first whether teachers receive help and technical support in their use of technology, as well as teachers' perspectives on the available facilitating conditions in their institutions. The facilitating conditions theme is divided into three sub-themes based on qualitative data: *internet connection*, *training and knowledge*, and *student number*.

Internet Connection

The majority of the informants noted that a fundamental issue hampering their use of ICT is the poor or total absence of a stable internet connection provided by the Algerian Higher Education Institutions as being a serious problem. As one teacher put it:

'The absence of Internet connection in the classrooms where we teach is really let's say ah ... real shortcoming because if we see University, we are deprived of Internet connection, and I don't know why still now Algerian Universities, most of them lack this direct internet connection. It's really a problem' (Interviewee 4)

Another informant reported that:

'We have internet connection. We have wireless internet without a password, no password. It means no access to the internet we have the internet but no access to this' (Interviewee 6)

Most of the informants indicated that they took into consideration their learner's access to the internet when they were preparing their courses. Nevertheless, they faced a big challenge related to the absence of stable internet connection due to the geographical situation by most of their learners. In this regard, an informant reported that:

'We know that many, many students living in rural places or that are considerate, shadow areas where they lack even the electricity, water. So, it is too far to talk about something called the Internet. So, the teacher should take this into consideration while preparing the courses.' (Interviewee 6)

Another interviewee expressed*:*

'Even if you take this into account, you always know that the internet connection is weak. So we just dropped the idea down and you go back to your traditional methods and you prefer to call Plan B. So we print copies just to avoid interruptions and let's say other unexpected break of loneliness.' (Interviewee 4)

Training and Knowledge

Most of the interviewed teachers stated that they did not receive any training concerning the use of ICT in their teaching career, for example:

'I haven't attended any training sessions concerning ICT usage because there is no training sessions in this field.' (Interviewee 6)

The participants identified that insufficient training poses a barrier to use, with one interviewee indicating that:

'Talking about training, attending seminars and talking about the use ICT is still insufficient. I personally feel that I need more training in utilising ICTs in terms of using SPSS for instance processing the results using those sophisticated online surveys and so on. So, we need to, we need to learn a lot. That's why part of our academic profile, research profile is based on your ability to master new ICTs.' (Interviewee 4)

Nevertheless, one of the informants mentioned that they had undertaken training sessions for using technology from the part of the University, but these were inevitably theoretical and without any pedagogical aspect. One interviewee reported that:

'I had a training session which was at my very first year at the University. And it was online. Right. That's why I think it was good, but I think it lacks a lot because it was online. We could not do practice and I think that ICTs to acquire significantly and positively ICTs, we need to practise and the practice was missing.' (Interviewee 1)

One informant said:

'I think this is the most important ignored part among the teachers' stuff, yeah. All what we need is training because technology varies and changes from time to time. We need to be engaged in continuous professional development, yeah. And we need training, frankly speaking, especially teachers of my older age. Training becomes a must.' (Interviewee 3)

Another respondent, on the other hand, described how he was capable of obtaining training on his own:

'And this is how things go in Algeria, there is no real training. So, we learn from our mistakes. We try to improve our level of ICTs relying on our own capacities.' (Interviewee 4)

Most of the informants expressed their enthusiasm and had ambitious plans for attending a training program on how to use IT features. An informant expressed:

'Actually, I am looking for one, yeah, I would love to, especially with unusual circumstances with the spread of COVID-19' (Interviewee 1)

While another expressed:

'We're expecting that the Ministry of Higher Education should think of providing more training for teachers. And this can be done through the organisation of study days and conferences that are devoted to the ICT. There are some conferences, but they still are not well specialised, people attending those conferences or not expressing is this there are stages… We need something that tells us, explains to us how prepare our course using ICTs.' (Interviewee 4)

Further, one informant stated:

> *'Training sessions or training programs are really beneficial. And absolutely, they provide, they provide new experiences, new information and new inventions in the field. So, we need to be or to update our knowledge concerning this field of teaching, let's say daily, weekly, monthly, and let's say yearly. Okay, we need to follow the thread of updating knowledge each time.'* (Interviewee 6)

Overall, the informants agreed upon one common point related to the absence of training on how to use ICT from the pedagogical side. An informant suggested:

> *'We need something that tells us explains to us how to prepare our courses using ICTs, and this is related to what to a new approach of teaching based on ICT. How can I organise my course according to ICTs skills?'* (Interviewee 4)

The Number of Students

One of the female teachers stated that the substantial number of students in the classroom cohort represents a pushing factor for her use of Information Technology within the classroom environment. She explained that:

> *'ICT facilitates the course, especially that students are numerous, the teacher cannot deliver everything so ICT, especially with the use of data show ICT. Yes, exactly. Here the teacher can pay attention to every single detail without forgetting anything.'* (Interviewee 1)

4.7.5 Teachers' Attitudes toward the Use of Technology

The construct of *Teachers' Attitudes toward the Use of Technology* (ATUT) of the theoretical framework of the present study is defined as overall affective reaction of teachers toward the use of ICT in their teaching practices. In this regard, ATU stands for an EFL teacher's liking, enjoyment, joy and pleasure associated with technology use in their classrooms. This study bridges the gap by using the revised Unified Theory of Acceptance and Use of Technology (UTAUT) Model as its theoretical framework, with the inclusion of "*Attitude toward Using Technology*" as an endogenous construct to examine the acceptance of ICT by teachers at the level of Higher Education Institutions in Algeria. The theme of Teachers' Attitudes toward the Use of Technology includes two sub-themes: the *motivation* and *enjoyment* derived from the qualitative data. Thus, this section shows how teachers feel about using educational technologies.

Motivation

The vast majority of informants said that they preferred to be able to incorporate ICTs into their teaching practices. The reasons they gave ranged from motivation to its interactive effects on the students and teachers. One male teacher gave reasons for this:

> *'I can remember something; the role of ICT was a great step in my teaching experience. That time I started using videos in teaching oral expressions because at that time on the way I used to teach oral sessions in the past was done in the traditional way. Students were less motivated. But just after using those students started using those videos, the motivation of the students raised because there's something new attractive, especially when using films or songs and so on. And they notice that there is it was a source of motivation, and also a source of interaction between teacher and students. However, there's less motivation to use ICT from the part of the administration staff'* (Interviewee 4)

Another interviewed teacher felt intrinsically motivated from using ICT in his classroom teaching practices. He expressed:

> *'I'm personally motivated, I'm intrinsically motivated, not extrinsically motivated, motivated to attend these sessions, because you can consider me among the advocates of ICT usage. I'm the one among the advocates, but since there are no training sessions, as I know, according to my knowledge, so where can you find these training sessions, please tell me tell me I will attend I'm eager to attend such sessions.'* (Interviewee 6)

Enjoyment

Teachers are more inclined to use ICT devices for learning if they find the resulting interaction intrinsically enjoyable or interesting. According to the findings of the interviews, three informants recognised the enjoyment factor as being critical to their usage of ICT devices, with the following supporting statements for this finding involving:

> *'I'm always enthused and involved in the technology improvement. Especially in the technical side, I see it more easy.'* (Interviewee 3)

> *'We have got two categories of people. Some people are for the use of ICTs, and they think that it's very beneficial, and it's high time to start using those ICTs. But some people are still stick to those traditional ancient methods and they refuse any sort of change and they stick to their old methods of teaching.'* (Interviewee 4)

Other informants, however, when asked about their attitudes toward the use of ICT in the future for their teaching practices, they declared that some teachers were still

reluctant, irrespective of their beliefs regarding the advantages of technology during teaching. In this regard, a male teacher reported that:

> *'We always have that kind of reluctant teachers towards all what is or what has a relation with technology. They are not encouraged to use ICT. So, we have advocates of ICT and we have those who are against'* (Interviewee 6)

While another informant mentioned the importance of taking care of students' attitude when dealing with the issue of ICT usage by stating that:

> *'It depends on the students' attitudes. Some students have the internet, but they are so reluctant towards working.'* (Interviewee 2)

Just as the survey questionnaire revealed, many Algerian Higher Education teachers generally have a positive attitude towards using technology and are able to see their pedagogic benefits although they have reservations about whether there are sufficient facilitating conditions to enable them.

4.7.6 Behavioural Intention

The Behavioural Intention construct in the theoretical framework of the current study is defined as teachers' decisions to perform particular behaviours, and represents a summary of teachers' readiness and motivation to act: the more an individual intends to do something, the more likely that behaviour is to be performed. According to the proposed study model, Behavioural Intention is the extent to which the Algerian Higher Education teachers are ready for using ICT in teaching EFL. The theme of Behavioural Intention involves two sub-themes: *Intention and Readiness* and *Willingness*.

Intention and Readiness

The informants were asked about their intention for using ICT in the future. One informant stated:

> *'Yeah, the intention starts from now. In the future we are planning to be more practical. So, the idea is presently intentions is in the present in the future. We need to be more practical and start putting things on in real practice. That's why we are expecting that things will change then every teacher Should or Must insert, incorporate, implement ICTs in his English courses.'* (Interviewee 4)

Another informant said:

> *'I am ready because I keep saying that I'm the one who can be considered as the advocates of ICT usage. But you will also notice that some teachers are not really ready to use technology or ICTs.'* (Interviewee 6)

Willingness

Most of the interviewed teachers expressed their willingness to encourage other colleagues to use ICT, deeming it to be an advantageous tool, irrespective of whether they applied it during their own teaching practices. Nevertheless, the teachers reported a number reasons that could discourage them from using it, for example, an informant suggested:

> *'I would encourage teachers at my University to engage in professional development courses and ICT. It's a good idea if we decide on a team where we can meet weekly or monthly or I don't know, and to decide on how to use this technology in teaching purposes.'* (Interviewee 2)

Another interviewee said:

> *'The use of ICT is becoming more important as a skill itself and as in teaching as in training. So, yes, I would encourage and help others at the same time.'* (Interviewee 3)

> *'I would encourage both students and learners not only teachers'* (Interviewee 4)

4.7.7 Use Behaviour (Actual Use of Information Technologies)

The Use Behaviour construct of the theoretical framework is defined simply as the adoption and use of the Information and Communication Technology (ICT). According to the proposed study model, Use Behaviour is defined as the decision of the Algerian Higher Education teachers to use certain technologies for specific teaching purposes. In the context of the current study, use behaviour in revised UTAUT model is also the actual adoption or usage of certain Information Technologies in classroom teaching. Informants were asked about the technologies they used in the lesson planning and teaching process.Hence,data Show, Mobile Phones, and Laptops were the most often mentioned pieces of equipment by the vast majority of the interviewees.

The informants then were asked about their use of the Pedagogical platform of Moodle LMS established by the Ministry of Higher Education. This platform was given higher importance especially with the unexpected outbreak of Corona virus (COVID-19) that led to the closure of schools and Universities in Algeria during the Spring Semester of March 2020. It would appear that teachers simply do not use the Moodle

LMS provided by the Algerian Ministry of Higher Education. Most teachers were unaware of it and five stated that they do not use it sometimes because the lack of Internet connection precludes it. There was a suggestion that the Ministry is acting on this:

> *"I do not use it although many corresponding emails arrived to Universities encouraging teachers to use it."*

These results are similar to that of the survey questionnaire which also revealed a fair proportion of teachers reporting no digital equipment being available or poor Internet connection.

4.8 Teachers' Thoughts on the Barriers to ICT Acceptance and Use

To gain more in-depth information, the teachers were also asked an open-ended question at the end of the interview to say what they thought were the barriers to the use of Information Technologies in the teaching and learning process. Most of the reasons given for barriers to acceptance and use of technology seem to be linked to several factors in the revised UTAUT model. Based on EFL teachers' responses, *the lack of training and knowledge about how to use ICT, lack of technical support, and reluctancy of teachers* were the top three hindrances. The following comments were typical:

Lack of Training and Budget

An informant remarked:

> *'The lack of training and the lack of means and the lack of the budget to buy the necessary equipments.'* (Interviewee 1)

Weak Internet Connection

All of the interviewed teachers agreed upon the lack of stable Internet connection as the main hindrance and challenge for both teachers and learners. An informant stated:

> *'I think the most important barrier is technical, weak Internet connection, the lack of sophisticated materials, the attitude of the Algerian Government to the use of ICTs, the devotion of the staff. There's less motivation to use ICT from the part of the administration staff. There is a lack of time. That's it.'*

Lack of Knowledge of ICTs

Another challenge that the EFL teachers faced in using ICT is the lack of knowledge of ICTs that they have to integrate technology in their teaching practices. In this regard, an informant noticed that:

> *'I think the first challenge is the lack of knowledge of ICTs because some, some teachers lack the necessary knowledge about how to use ICT. So I would encourage them to engage in this. I think the other one, some technical problems. Yeah, they may be barriers, because some teachers are really encouraged to use the ICTs but when they face a technical problem, it's like they give up the whole matter.'* (Interviewee 5)

Lack of Technical Support

The vast majority of the interviewed teachers agreed upon the lack of technical support as the main barrier for not using ICT effectively in their classroom teaching practices. One of informants indicated:

> *'Among the big barriers I first of all, I start with a technical support, absence of technical support. reluctance by some teachers and the negative use by students and negative use of call it as you like, ICT by students and also the main point that you have stated, also the absence of training sessions or training programs, many programs in this field.'* (Interviewee 6)

In accordance with the number of the aforementioned hindrances encountered by the majority of informants for the use of ICT in their teaching practices, an informant finalised his interview with the following advice:

> *'To the Dean of the Faculty, I think he should provide every single classroom with permanent Internet. Yeah. What else? Technician! Yeah, technician who is responsible in solving problems when occurring during the lesson. Why not coming in preparing some sessions of training for the language teachers concerning the use of this modern technology. Yes, this all what I guess it's very important.'* (Interviewee 2)

To gain more in-depth information, the teachers were also asked an open-ended question at the end of the questionnaire to respond in written comments they considered other factors as enablers and/or barriers hindering the use of ICT in classrooms. Based on their responses, the lack of technology resources, a substantial number of students in the class, and small classrooms were the top three hindrances. Teachers also mentioned that lack of knowledge and skills regarding ICT use, students' resistance to ICT use, and the low achievement level of students hindered them from using ICT for instruction. Moreover, the lack of training courses, time constraints, curriculum, the resistance of teachers, and managerial issues were other obstacles mentioned by the teachers.

In addition to quantitative data analysis, several issues have been also revealed through an open-ended question at the end of the questionnaire in accordance with the enablers and barriers to the use of ICT. The analysis of extensive transcripts, extracted from teachers' written comments, revealed a range of critical parameters which determine their difficulties and concerns with regards to the use of ICT in their teaching practices. The analytical process of the results revealed two overarching themes of *enabling* and *hindering* factors.

➤ Enabling and Motivating Factors for the Use of ICT

The majority of the teachers focused on the issue of the enhancement of ICT use among students. The following quotes are representative of teachers' perceptions:

> *'The use of Technology increases motivation and makes the students actively engaged in the process of learning.'*

We believe that what would really encourage teachers to use ICTs in the classroom would be to provide them with well-equipped classrooms with ICT and above all regularly revised and maintained and also to find an available assistance. However, teachers faced my obstacles that hampered their use of ICT in their teaching practices that are presented below.

➤ Obstacles for Using ICT

The qualitative analysis of the data showed that the responding teachers stated a number of enabling and hindering factors for their use of ICTs in the classroom teaching practices. A holistic view revealed that three main factors prevented teachers' use of ICT. a) *lack of Internet connection*, b) *lack of technical support and technological tools*, and c) *lack of training and support*.

•*Lack of Internet Connection*

The majority of the teachers in the sample reported that they lacked connectivity to the Internet, suitable pedagogical training, and the digital skills, necessary to effectively use ICT tools in their teaching practices. More than half of the teachers provided comments like:

'The lack of access to the Internet is a big issue at university.'

'University should first provide teachers with Internet access before talking about the use of ICTs in teaching and learning.'

• *Lack of Technical Support and Technological Tools*

Finally, some teachers paid more attention on the absence of technical support and lack of tools for both, students and teachers. The following comments were typical:

'Using ICTs while teaching is a great idea that we should focus on. Sometimes we do not have the opportunity to use them because of some technical glitches or lack of tools. So these things discourage us from using them.'

'The lack of equipment and technology teams to help us when we face difficulties.'

'We need equipment and Internet access in the classroom to teach effectively.'

Another respondent further commented, *'What discourages most teachers is to find that there is no power at the moment you intend to start your lesson or no remote control for switching on the walled data show and the like.'*

• *Teachers' Lack of Training and Support*

Some teachers paid more attention on the absence of training opportunities, technical support and lack of tools for both, students and teachers.

'We should have training how to use different websites for teaching and learning.'

'Absence of training and of assistance are an obstacle and create a feeling of frustration that can inhibit teachers from using ICT.'

Many teachers expected more training programs and supportive actions in this digital age from the Ministry of Higher Education and other educational authorities. Many similar statements like the following quotes are representative of their expectations regarding professional support.

'The institution or decision makers should help teachers and learners in using ICTs. They should implement their classrooms with the necessary equipment. They should also provide teachers with training days to master how to use ICT in education, support learners to well use technology.'

4.9 Summary of the Qualitative Findings

The second section of this chapter has presented the analysis of the qualitative data collected during Phase 2 of this study. In this phase, the data were collected by semi-structured interviews conducted with six Higher Education EFL teachers employed in the Department of English at Hassiba Benbouali University of Chlef during the Academic Year 2021–2022.

Further analysis was conducted to provide an understanding of the reasons behind the use or non-use of ICT by Algerian Higher Education teachers. While all teachers shared a number of factors, teachers' lack of training from pedagogical angle was found to be the most influential factor that influenced their effective use of ICT in EFL classrooms.

Based on the above analysis of data collected from the semi-structured interviews in Phase Two of the present study, there now follows a summary of the qualitative findings of each construct with the inclusion of the factors that may enable or hamper teachers from using ICT in their teaching practices.

Performance Expectancy:

The majority of teachers found ICT to be beneficial in their classroom teaching practices. The interviewees reported that increased productivity and the usefulness of the various applications were helpful.

Effort Expectancy:

The majority of interview informants gave positive comments to the use of Information Technology in their teaching practices such as ease of use, mobility, flexibility and accessibility, as well as its efficiency in terms of time and effort. One informant stated that using ICT in the classroom requires more time from teachers, which is problematic given their already enormous workload and responsibilities. However, this did not exceed the reported benefits of ICT for time management, where all of the interviewees saw technology as a facilitator in achieving their objectives.

Social Influence:

Two major themes emerged from the qualitative investigation of the interview data: encouragement and support. All of the interviewees stated that they were encouraged to

use ICT, and that their enthusiasm and satisfaction were a result of self-motivated encouragement and technology use, with peers having a big influence on their level of encouragement to use ICT. Teachers reported a lack of institutional impact on ICT use, therefore support as a social influence was self-motivated.

Facilitating Conditions:

The qualitative findings reveal that the more infrastructural and technology support teachers perceive, the more likely they are to use ICT in their teaching practises, despite reports of a lack of support in terms of Wi-Fi availability and training. The vast majority of respondents agreed that simply giving a resource does not guarantee its use, and that teachers should be trained about and given pedagogical direction on how to use ICT for effective teaching.

Attitude toward Using Technology:

The qualitative analysis of the interview data provided two important themes: enjoyment and motivation. All informants acknowledged the enjoyment factor as being crucial to their usage of technological devices, while several informants expressed privacy concerns about using ICT in the classroom.

Despite a generally positive attitude toward ICT, many teachers thought they lacked the knowledge and skills to use it pedagogically, and there was a lack of understanding of the resources available at the level of Higher Education Institutions, such as the pedagogical platform of Moodle LMS. The available training was deemed insufficient and not always beneficial or relevant to the proper implementation of ICT.

Behavioural Intention:

All of the respondents said they planned to use ICT in the future and showed their readiness and willingness to include it into their teaching practices as well as encouraging other teachers using it, and they recognised the potential benefits of doing so if their universities supported and promoted it.

Barriers to the Acceptance and Use of ICT:

A number of obstacles emerged from the qualitative investigation of the interview data. Teachers indicated the obstacles they saw in using ICT tools into their teaching

practices such as *the lack of training and knowledge about how to use ICT, lack of training support, and reluctancy of teachers.*

Additionally, the qualitative open-ended question at the end of the questionnaire contributed more in-depth and rich data to the numerical data by discovering the enablers and barriers to the use of ICT.This added to the trustworthiness of the analysis by minimising the possibility of misinterpretation. Constraints to technology acceptance and use appear to be associated with several factors in the revised UTAUT model.

4.10 Triangulation of Quantitative and Qualitative Data

Table 4.24 shows the joint display (triangulation) of quantitative and qualitative data findings that arose from this chapter's data analysis.

Table 4.24: Triangulation of the Quantitative and Qualitative Findings

Quantitative Findings	Qualitative Findings
Performance Expectancy (PE)	
➢ ICT is useful for teaching and learning • Substantial positive relationship between Performance Expectancy and *Attitude toward Using Technology* • Moderate relationship between Performance Expectancy and Behavioural Intention • Performance Expectancy significantly influences teachers' Attitudes Towards Using Technology. • Performance Expectancy does not influence Behavioural Intention and Use Behaviour	➢ ICT is useful for teaching and learning Increased productivity Usefulness of different apps

Effort Expectancy (EE)	
➢ Ease of using ICT for teaching purposes • Substantial positive relationship between Effort Expectancy and attitude toward using technology • Substantial positive relationship between Effort Expectancy and Behavioral Intention of using ICT • Effort Expectancy significantly influences teachers' Attitudes Towards Using Technology. • Effort Expectancy does not influence behavioural intention	➢ Ease of using ICT for teaching purposes Mobility ,flexibility and accessibility Efficiency in time and effort The additional time gained when using ICT inside the classroom
Social Influence (SI)	
➢ The impact of others (friends colleagues etc) on teachers' use of ICT • Moderate relationship between social influence and *Attitude Toward Using Technology.* • Moderate relationship between social influence and behavioural intention • Social Influence does not influence *Attitude toward Using Technology* and Behavioural Intention.	➢ Self-encouragement applied in using technology for teaching ➢ Colleagues are encouraging factors for Information Technology use ➢ Lack of administrative support is an issue
Facilitating Conditions (FC)	
➢ Insufficient technical support for using technology in teaching and the absence of training opportunities	➢ Lack of support such as Wi-Fi password and training

• A weak relationship between facilitating conditions and attitude towards using technology. • A significant moderate relationship between Facilitating Conditions and behavioural intention • A moderate relationship between Facilitating Conditions and actual use of ICT • Facilitating Conditions do not influence attitude towards using technology and behavioural intention • Facilitating conditions significantly influence use behaviour	➢ Need for training and guidance on how Information Technology can be used pedagogically
Attitude Towards Using Technology (ATUT)	
➢ Informants have positive attitude toward information technology in their teaching practices. • Substantial positive relationship between informants' Attitude Towards Using Technology and behavioural intention • Substantial relationship between Attitude Towards Using Technology and actual use of ICT • Attitude Towards Using Technology does no influence actual use of ICT	➢ The respondents have a generally positive attitude toward information technology in their teaching practices • Motivation of teachers and students • Enjoyment and enthusiasm • Reluctance
Behavioural Intention (BI)	
➢ Informants have the intention of using Information Technology in their teaching practices in the future.	➢ Majority of informants have the intention and willingness of encouraging others to use

• Significant substantial relationship between Behavioural Intention and actual use of ICT • Behavioural Intention influences teachers' actual use of ICT.	Information Technology in their teaching practices in the future. • Comprehensive acceptance of ICT and the willingness to apply it
Actual Use of Technology (AUT)	
➤ Teachers use many of their personal ICT devices such as mobiles and tablets whether for the preparation of their courses or for teaching practices in the classrooms. ➤ Algerian Higher Education teachers' favourableness towards acceptance and use of ICT in their teaching practices. • A significant relationship of actual use of ICT with all the aforementioned six psychological variables **(PE, EE, SI, FC, ATAUT and BI)** • Teachers' **Actual Use of Technology is** significantly influenced by Facilitating conditions and Behavioural Intention	➤ Algerian Higher Education teachers have the decision of the use of certain technologies for specific teaching purposes by bringing their own devices such as laptop and mobile phone. ➤ Algerian Higher Education teachers' favourableness towards acceptance and use of ICT in their teaching practices.
Barriers to the Acceptance and Use of ICT	
➤ A number of barriers hamper teachers 'use of ICT • Limitation of infrastructure • The lack of technical support. • Lack of Internet Connection • Lack of professional development opportunities and training • Complexity of integrating ICT	➤ A number of barriers hamper teachers 'use of ICT • Attitude of the Algerian Government to the use of ICTs • Lack of Internet Connection • Absence of technical support • Less motivation to use ICT from the part of the administration staff

• Lack of time and ICT knowledge	• Lack of knowledge of ICTs • Lack of time • Reluctancy of some teachers • The absence of training session

This section of the chapter has analysed the integrated findings from a questionnaire and interviews with the EFL teachers at Hassiba Benbouali University in relation to the antecedents of ICT acceptance and use in their classroom teaching practices. In light of what has been mentioned in the discussions in Chapter 3, linking quantitative scores with qualitative quotes is an efficient display technique for presenting data from mixed method studies. Overall, the qualitative component sheds additional light on the quantitative component by providing further understanding of the major determinants that influence teachers' acceptance and use of ICT. Thus, the themes from the quantitative survey and qualitative semi-structured interview results offer a sound explanation of the factors influencing teachers' acceptance and use of ICT.

Conclusion

This chapter has presented the analyses for the quantitative data resulting from the questionnaire survey, and the qualitative data emerging from the semi-structured interviews. This was then triangulated to compare the findings, which indicated a high level of agreement in the findings extracted from both data collection methods. The findings of Phase Two semi-structured interviews substantially corroborate the findings of Phase One survey questionnaire in the current study, but they also highlighted some underlying issues specific to the acceptance and use of ICT in Algerian Higher Education, which help to explain the influence of some of the factors in the proposed revised UTAUT model. Appendix G contains a list of these concerns and the factors that affect them. Next, a comprehensive discussion on the main findings that have emerged from the study is carried out in Chapter 5, with links back to the literature reviewed in Chapters 1 and 2.

CHAPTER FIVE

DISCUSSION, CONTRIBUTION, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

Introduction

In the previous chapter, detailed information about the data was presented in order to test the research hypotheses gathered from the quantitative questionnaire and to answer the research questions drawn from the qualitative interviews. The goal of this mixed-methods sequential explanatory study was to develop and empirically validate the revised UTAUT Model to measure EFL teachers' acceptance and use of ICT. At the same time, it aimed to identify the factors that influence behavioural intentions and use behaviour of ICT in the context of some of the Algerian Higher Education Institutions.

This final chapter aims at presenting an in-depth discussion of the major findings from the two phases of the current study emerging from the analyses conducted in Chapter 4, with links to the literature presented in Chapter 1 and Chapter 2. These findings are discussed with respect to the objectives of the study and the corresponding research questions and hypotheses, as stated in the General Introduction, in order to determine the acceptance of Information and Communication Technology (ICT) among teachers when teaching English as a Foreign Language (EFL) in some Algerian Higher Education Institutions. More particularly, this study exclusively focused on the key factors that influence teachers' acceptance and use of ICT in EFL classroom teaching practices.

As this study is principally based on one revised research model (i.e., UTAUT), in order to respond to the three research questions, the first and second questions are examined through the quantitative results emerging from the questionnaire survey, while the third question is discussed on the basis of the qualitative findings emerging from the semi-structured interviews. The qualitative and quantitative research findings that arise herein are interpreted primarily based on the modified research model of UTAUT.

Regression and moderation analysis were conducted to investigate the factors and test the research hypotheses concerning the teachers' behavioural intention and use behaviour regarding the adoption of Information Technology in their teaching practices. The findings of the survey questionnaire (see Part I in Chapter 4) revealed that the most significant construct of the revised UTAUT model when applied to behavioural intention to use ICT in the Algerian Higher Education context was *Teachers' Attitudes toward Using Technology* as an added factor to the original model of UTAUT, reflecting the positive attitudes that EFL teachers generally reported toward ICTs, whereas Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions had no

impact. The study's findings also showed that Behavioural Intention and Facilitating Conditions had the most significant influence on Use Behaviour for using ICT, whereas Attitude toward Using Technology had no impact. Statistical analysis demonstrated that there are significant correlations between several factors and behavioural intention to use these technologies as well as on actual use. Moreover, the results revealed that there were a number of moderating factors that influenced the relationship between the independent variables and dependent variables, which are discussed later in relation to each variable.

The results of the interviews detailed further the issues that Algerian Higher Education teachers face regarding the use of ICT in their teaching practices. The qualitative findings gave more in-depth explanation to the quantitative findings. The qualitative and the quantitative findings in this study supported the principal constructs of Venkatesh et al.,'s (2003) modified Model of UTAUT. Hence, the answers regarding each factor are included in the section below where an analysis of each factor in terms of the findings of both phases of the research is given.

This chapter therefore discusses the integrated findings derived from both quantitative and qualitative phases. It is divided into two main sections: the first section (Section 5.2) focuses on discussing the main findings that emerged in this study in relation to previous empirical and theoretical literature. The second section of this chapter (Sections 5.5 to 5.9) summarises the findings of the study, draws the study to a conclusion and provides implications for practice and future research. It also includes a consideration of limitations of the study and recommendations for further research.

Section One: Discussion of the Main Findings

This first section of Chapter 5 provides a discussion on the main findings pertaining to the relationship between five predominant factors from the modified UTAUT model: (a) Performance Expectancy, (b) Effort Expectancy, (c) Social Influence, (d) Facilitating Conditions, and (E) Attitudes toward Using Technology and their association with Behavioural Intention and Actual Use of ICT. In the qualitative interviews, the data on the determinants of teachers' acceptance and use of technology in the Algerian Tertiary Education by EFL teachers at Hassiba Benbouali University of Chlef was gathered in response to questions designed to answer the research questions and to complement the data drawn from the quantitative questionnaire in Phase One of the present study.

5.1 Factors Related to Acceptance and Use of ICT by Algerian Higher Education EFL Teachers

This research study has investigated the impact of predictors such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitudes toward Using Technology on the intention of university EFL teachers to adopt and use ICT in their classroom teaching practices. The following sub-sections provide a detailed discussion of the factors, independent variables, that determine teachers' Attitudes toward Using Technology, Behavioural Intention and Use Behaviour of ICT for teaching EFL, as well as the significant intervening variables of the research model. Each factor is discussed in terms of the findings of both phases of the research and related to findings from the literature. The factors related to Behavioural Intention to use ICT are discussed first, in the order in which they significantly predict variance; followed by the factors directly related to Use Behaviour in order of significance. The assessment is undertaken by using the quantitative and qualitative data, where the findings are integrated in order to investigate the teaching of EFL in Algerian Higher Education Institutions in the context of ICT usage.

5.1.1 Performance Expectancy

According to the proposed study model, Performance Expectancy (PE) refers to the extent to which these Algerian Higher Education EFL teachers think that using ICT in teaching can increase their job performance. Hence, PE refers to the advantages in using ICTs as perceived by the informants.

Many studies (García Botero, Questier, Cincinnato, He, Zhu 2018; Hoi 2020) consistently highlighted that PE is the most significant forecaster of Attitude Toward Using Technology (ATUT) because users usually look to the benefits to be gained from a particular technology. Both phases of the study were designed to address the question:

To what extent and why does PE explain the variances in the behavioural intention to use ICT in the Algerian Higher Education Institutions (HEIs)?

Four questions were included in the questionnaire to assess crucial aspects of PE, including teachers' perceptions of the use of ICT in teaching and learning, accomplishing tasks faster, improving student performance, and increasing productivity. The results of the questionnaire revealed that teachers almost unanimously agreed that ICTs were useful in their responses to all four questions. The overall mean score of the PE scale was (4.05) with a standard deviation of (0.991), indicating that PE has a strong influence on ICT use;

and PE was the most significant factor to explain variances in Algerian University teachers' intention indirectly through attitude to adopt and use ICT with the standardised coefficient (ß =0.35, t=2.26, p <0.05).

The findings of the current study revealed that Performance Expectancy was found to be the most powerful predictor of teachers' attitude toward the use of technology. This finding concurred with Hoi (2020) and Botero et al. (2019)'s studies on the acceptance and usage of Mobile Assisted Language Learning (MALL) at different Higher Education Institutions, thus further consolidating the pivotal role of this construct in the UTAUT model. This essentially means that an individual who strongly believes that technology is useful is more likely to have the positive attitude to adopt ICT when compared to an individual who believes that technology is less useful. Performance Expectancy, on the other hand, did not appear to predict teachers' Behavioural Intention to use ICT in their classroom teaching practices. Other empirical research studies (Kim, Lee 2020) and Venkatesh et al. (2003) have demonstrated that Performance Expectancy is the biggest predictor of acceptance and use of ICTs in both voluntary and involuntary settings.

These findings were reflected in the interviews, with teachers emphasising the specific ways in which ICTs were beneficial to them, such as the safer use of wall-mounted datashows and how students benefited from these technologies in their learning. However, the qualitative findings can partly explain this apparent contradiction, with some of the interviewees explaining that although they believed that ICT has pedagogical potential, they did not have sufficient access to training and had concerns regarding ICT knowledge and skills. Moreover, they believed that ICT might be more useful outside the walls of the classroom.

As opposed to the general literature on the UTAUT model (Botero et al., 2019; Dwivedi et al., 2019; Venkatesh et al., 2003) where Performance Expectancy is theorised to have no direct effect on the use behaviour, it was found in the present study that Performance Expectancy not only influenced the behavioural intention indirectly via attitude, but also directly predicted the usage of technological devices for language teaching. A potential explanation for this finding was that informants in the current study might have successfully related their ICT usage to ICT usefulness.

The analyses of the quantitative findings revealed that both gender and age of the teachers moderated the relationship between Performance Expectancy and Behavioural

Intention to use ICT among teachers such that it is more significant for female and older workers. This is consistent with findings from previous studies in different educational contexts such as in Singapore (Teo, Noyes 2014) and in Colombia (García Botero, Questier, Cincinnato, He, Zhu 2018). It is exciting that PE demonstrated an indirect predictive power on teachers' behavioural intentions to use ICT when moderated by gender and age. Female teachers were more likely to be influenced by many advantages in using ICT; an effect which was not influenced by teaching experience. This could be attributed to a gender bias among informants, as the study included more female teachers who were younger, more easily influenced by higher status people, and hence more eager to try out new innovative pedagogical approaches.

Compared to the literature discussed in Chapter 2, this finding is broadly consistent with the Performance Expectancy in the model of behavioural intention for using technology moderated by gender and age, and was unexpectedly more significant among the older age group teachers who felt the usefulness of ICT and its educational advantage more than the younger and middle age groups. A large number of studies report empirical evidence validating the benefits of ICT and supporting the notion that ICT can facilitate teaching and learning at a range of educational levels (Hu, Laxman, Lee 2020). However, it is contrary to the findings by Hu, Laxman, Lee (2020) regarding age groups, younger academics (aged below forty) obtained higher perceived scores in most of these factors. In contrast, the oldest age group (above 50 years' old) obtained the lowest scores in all perceived constructs.

Furthermore, the qualitative results highlight that all the interviewees found Information Technology to be beneficial in their academic teaching, offering increasing productivity and usefulness through the different apps available via ICT. The combined findings suggest that stakeholders in Higher Education should develop pedagogical policies to take advantage of the perceived usefulness of ICT for the benefits of the Algerian Higher Education teachers, providing them with teaching opportunities to enable new content to be offered to students to improve learning quality.

The potential of new technologies enables new pedagogical approaches to be implemented and minimises the dependence upon old approaches. The findings of both phases of the study answer the research question by demonstrating that Performance Expectancy is a significant factor in explaining variances in Algerian University teachers'

intention to use ICT indirectly via attitude, and that the reason is that they generally perceive its potential to enhance the teaching and learning experience, despite the fact that there may be reasons that make using it impractical or difficult in their institutions. Some of the interviewed teachers highlighted that its value was in the teachers' ability to apply it directly to their subject area, and that this training had to be relevant in order to do so.

5.1.2 Effort Expectancy

According to the proposed study model, Effort Expectancy (EP) refers to how easy it is for the Algerian Higher Education teachers to use Information Technologies in their teaching practices, specifically the complexity, ease, or difficulty of use, and the effort devoted to using ICTs in EFL classrooms at the Department of English at Hassiba Benbouali University of Chlef. In the literature, EE has been recognised as a crucial factor in explaining technological acceptance. The study thus addressed the following question:

To what extent and why does Effort Expectancy explain the variances in the behavioural intention to use ICT in the Algerian Higher Education Institutions (HEIs)?

In the questionnaire four questions were devised to test how clear, easy and flexible to use the teachers perceived ICT to be. Surprisingly, teachers were most likely to think that new ICTs were easy to learn, even though a great majority also agreed that these technologies were clear and simple to use, and that they were skilled at using ICT. There was a small group of people who disagreed or were neutral on these issues and this was further investigated by the interviews. The overall mean of the EE scale was 3.63 with a standard deviation of 0.994, this indicates that teachers in the Algerian Higher Education Institutions generally believe it is easy to use ICT in their teaching practices. The results showed that EE was the second most significant factor in explaining the variances in the Algerian Higher Education teachers' intention indirectly through the new added construct *attitude toward using technologies* with the standardised coefficient (ß =0.37, t=2.12, p <0.05).

The research findings herein highlight that Effort Expectancy was another predictor of teachers' Behavioural Intention in an indirect way through the mediation of the construct of Attitude toward Using Technology. That is, an individual who believes that ICT is easy to use is more likely to have the positive attitude to use ICT in comparison with someone who believes that ICT is less easy. However, the findings revealed that Effort Expectancy had no direct effect on Behaviour Intention. Rather, its effect on Behaviour Intention was

fully mediated by attitude. This finding was in line with (Hoi 2020) and Altalhi (2020), but diverged from Botero et al. (2018) who considered Effort Expectancy as a non-determinant of Attitude or Behavioural Intention.

The qualitative findings can partly explain this apparent contradiction, as some of the interviewees explained that although they recognised the ease of use of ICT, as well as its flexibility and accessibility, some indicated that classroom use required additional time to set up the tasks and monitor the students. Many interviewees expressed enthusiasm for the opportunity to receive training that would both make the technological tools easier to use and show them how to improve their teaching practices. Teachers' perceptions of the amount of effort required to use ICT were influenced by the length of time required for practice. Also, even if the tools were simple to use, they could not be used in the classroom if they were not available or if technical support was lacking. Based on the comments by the responding teachers, technological tools will become easier to use with the right training and support.

The findings of this study are congruent with those of prior studies conducted in different contexts, such as the Kingdom of Saudi Arabia (Alghamdi,2017). Alghamdi sought to determine the key factors that influence teachers' acceptance of smart mobile learning tools in their learning and teaching activities in Saudi Universities. According to Alghamdi (2017), Effort Expectancy had no direct influence on the learners' use of mobile technology. This finding could be explained by the fact that Alghamdi's (2017) informants were restricted to only three Universities in Saudi Arabia.

Given the various factors that mediated the roles of the construct of Effort Expectancy, such as gender, experience, and age (Šumak, Šorgo 2016) and the caveats by Venkatesh et al. (2003) that the role of this construct dwindled over time, the results of the current study regarding Effort Expectancy should be treated with caution. However, the findings of the current study revealed no gender, age, or experience differences that appeared to impact on the benefit assessment level of Effort Expectancy and Behavioural Intention to use ICT.

The findings of the statistical analysis are supported by the qualitative analysis, which showed that the majority of the interview informants affirmed the ease of use of ICT, whereby the 'ease of use' theme was mentioned many times throughout the interviews, which indicates a high perceived ease of use of ICT emerging from the qualitative interviews. Flexibility and accessibility were another theme representing Effort

Expectancy, where most of the interview informants found ICT easy to learn, thus increasing the influence of Effort Expectancy on the teachers' behavioural intention for using ICT. This finding asserts the ease of use as an essential predictor of teachers' acceptance of ICT.

Thus, this finding suggests that instructional designers should take into account the ease of use and flexibility when designing teaching materials. Managers and decision makers in Higher Education, Deans of Faculties, and Heads of Departments in the Algerian Higher Education Institutions should therefore consider the ease of use and flexibility when making decisions regarding purchasing or designing teaching systems, in order to increase acceptance among teachers in terms of ICT usage in their teaching practices. Thus, teachers need guidance on how to make effective use of applications that are already available.

Both phases of the research answer the research question by indicating that Effort Expectancy is a significant factor in explaining variances in Algerian Higher Education teachers' intention to use ICT indirectly via attitude. The reason for this was more deeply explored in the interviews which showed that teachers felt ICT would be easier for them to use if they had training and support and the time to practise.

5.1.3 Social Influence

According to the proposed study model, Social Influence (SI) is described as the degree to which Algerian Higher Education teachers perceive that important persons influence the use of technology in their teaching practices, specifically refers to the stakeholders involved in all stages of education activities, including policy-makers, the Dean, the Head of Department, colleagues, and students in the present study. Therefore, both the questionnaire and the interviews were constructed to address the same question: ***To what extent and why does Social Influence explain the variances in the Behavioural Intention to use ICT in the Algerian Higher Education Institutions (HEIs)?***

The questionnaire posited five questions about whether teachers thought their colleagues, friends, and students thought they should use ICT; whether colleagues had helped them to do so. Although the teachers were more likely to agree than disagree that others' attitudes toward ICT was positive (especially colleagues' attitudes), the results were inconclusive, especially when it came to students' attitudes, which many teachers believed were negative. The overall mean of the SI scale was 3.4 with a standard deviation of 0.570,

this implies that current perceptions of EFL teachers of other people's views on their usage of ICT in the Algerian Higher Education are mostly positive. Although, Social Influence was not shown to be statistically significant in explaining variance in the Algerian Higher Education teachers' Behavioural Intention to use ICT, there was a moderate correlation.

With regard to the survey findings, the descriptive statistical tests revealed that the teachers believed in the importance of social influences, which means that if teachers begin to use and become comfortable with an ICT system, they may begin to convince their colleagues and friends to do so as well. However, inferential statistics showed that such positivity had no meaningful influence on teachers' intentions to use ICT or their actual usage behaviour. This finding contradicted Venkatesh et al. (2012)'s original findings as well as a significant number of quantitative studies that have examined the predictive power of SI on technology acceptance and use.

The semi-structured interview data revealed that all interview informants were encouraged to use ICT, with self-encouragement and encouragement from colleagues being the most motivating factors, whereas universities were judged to be a less motivating factor for ICT use. These findings were corroborated by qualitative data, which revealed that Social Influence was not seen as positively impacting intention to use ICT, as responding informants viewed administrators as mostly paying lip service to the use of ICT in classrooms. Several teachers emphasised the necessity of self-motivation in the absence of encouragement from others working as administrators. Because of a lack of clear vision from management and a lack of instructions on the policy for using ICT. It is apparent that many teachers are not explicitly encouraged to use ICT in their classrooms. It became clear through the interviews that the use of technology in some or even several Algerian Higher Education Institutions is often the product of the teacher's own initiative rather than based on any formalised plan for training or support.

Furthermore, the findings further showed that the interacting moderators of gender, age, and teaching experience on social influence had no influence on the teachers' attitudes and intentions to use ICT. This finding of negligible or no effect on both teachers' intention to use ICT and their use behaviour is contradicted by Lewis et al. (2013), who found that Performance Expectancy, Effort Expectancy, and Social Influence are the most significant antecedents in the context of teachers' use of technology. According to Venkatesh et al. (2012), Social Influence was also a favourable predictor of Behavioural Intention.

Furthermore, Altalhi (2020) discovered that Performance Expectancy and Social Influence influenced attitude. However, the influence of Social Influence on teachers' *Attitudes toward Using Technology* and Behavioural Intention in EFL is rejected in the current study, even with the presence of interactions with the moderating variables of gender, age, and teaching experience. Thus, Social Influence construct is deemed to be nonsignificant on its influence on Behavioural Intention to use technology which is in line with the finding of the researchers Yakubu, Dasuki (2019). This finding can be interpreted as a result of the level of voluntariness, making it likely that Social Influence will be a significant predictor of behavioural intention and use behaviour if the context changes to Algerian Higher Education Institutions implementing ICT in teaching practices as a mandatory institutional policy. In this regard, Venkatesh et al. (2003) claimed that the construct (Social Influence) is insignificant in a voluntary setting. They noted, however, that Social Influence is most significant when technological use is mandatory.

Since Algerian teachers tend to be relatively independent and have considerable autonomy over the type of technology they use, as confirmed in the qualitative findings where the majority of the teachers' motivation to use technology was '*individual attempt*' and '*individual effort*', this result can be accepted. Further, Venkatesh et al. (2003, p. 469) claimed that '*the role of social influence constructs has been controversial*' due to the number and variety of the related constructs that were included and excluded in different studies. Much also depends on the effect of individual characteristics on the relationship between Social Influence and Behavioural Intention or technology use (Venkatesh et al., 2012).

Research findings from numerous studies, conducted in an Arab world context, revealed that that Social Influence significantly impacts the informants' behaviour intention for using mobile learning technology. For instance, Alharbi et al.'s (2017) study examined the factors that influenced university teachers' intentions to use mobile learning at Hail University, again using the quantitative survey method of data collection, where it was found that Social Influence predicted the teachers' use of mobile learning. Despite this study applied the same model, its findings contradict those of the current study in terms of the effect of social influence. However, Alharbi et al.'s (2017) study was limited to one University and excluded the inclusion of the moderating factors.

In this study, the interaction of the moderator factors indicates that Social Influence had no significant impact on the teachers' intention to accept ICT or their use behaviour. Older teachers who were more concerned about what their friends and family thought of ICT were more likely to use it, and were more motivated to do so because of the social influence of individuals they regarded to be influential. According to Al-Gahtani et al. (2007), older teachers' responsiveness to Social Influence may be due to the fact that older teachers are particularly vulnerable to peer pressure to embrace and use ICT because this effect can extend to their teaching practices. Because older teachers had administrative positions, younger teachers may put pressure on them to accept and use ICT. One of the motives for using technology, according to Interviewee 2 (who is over 56 years old), is 'teacher competitiveness.'

The qualitative findings emerging from interview data presented two important themes in accordance with the construct of Social Influence: encouragement and support. All the interview informants reported that they were encouraged to use ICT. The highest sources of encouragement were from colleagues and self-encouragement, while Faculty Administrators at Universities were found to be less encouraging factors for using Information Technology. Moreover, one of the informants emphasised on the crucial role of the surrounding environment for teachers' effective use of ICT by citing his experience while being on a scholarship in England. In this regard, interviewee 4 revealed that '*When arriving in England, we have discovered that there is a huge gap between what's happening in Algeria in terms of ICT use, and how people are using ICT in an effective way there in England. We realised that we should rely on ICTs and not just sticking to traditional ways of teaching.*'

This finding suggests that policy-makers in the Algerian Higher Education Institutions have to create a supportive social environment before implementing ICT, including colleagues and professors as early adopters who can take the lead in the later phases (Rogers, 2003). Creating an encouraging environment will positively influence teachers' behavioural intention for trying this new technology (Tan et al., 2012). Therefore, colleagues could well have influenced teachers' perspectives on using Information Technologies (Hu, Laxman, Lee 2020).

Studies in Higher Education Institutions have shown that proper encouragement and support from administration is a crucial factor in enabling teachers to use ICT (Kozma,

2008; Ismail, 2010; and Wong et al. 2008). However, this appeared to be lacking in the experience of many teachers in the samples for both phases of this research. Furthermore, some teachers found it difficult or impossible to successfully integrate ICT into their teaching practices due to inadequate or non-existent facilitating conditions despite any encouragement to do so.

In summary, the findings of this research go in line with the empirical study's conclusions of the researchers (Law & Chow, 2008) indicating that teachers with a stronger traditionally important orientation were the teachers least likely to be using ICT in their teaching practices whereas those teachers with a stronger 21st -century orientation (i.e., the lifelong learning and connectedness orientations) were the teachers most likely to be using ICT in their teaching practices.

5.1.4 Facilitating Conditions

According to the proposed research framework, the construct of Facilitating Conditions (FC) is defined as the degree to which Algerian Higher Education teachers believe that organisational and technical infrastructure elements exist to support the use of Information Technologies and to eliminate the barriers that hamper the use of ICT within Higher Education. It includes technical support, adequate technology equipment and software, support from colleagues and University Administration. Accordingly, both phases of the research were created to answer the following question: ***To what extent and why do Facilitating Conditions explain variances in the use of ICT in the Algerian Higher Education Institutions (HEIs)?***

The survey asked teachers five questions about Facilitating Conditions. The overall mean of the FC scale was 3.07 with a standard deviation of 0.966; this indicates that the teachers' attitudes towards the current facilities that support their use of ICT are at a medium level. Also, FC was the second most significant factor to explain variances in Algerian University EFL teachers' Use Behaviour of ICT with the standardised coefficient (ß =0.34, t=2.23, p <0.05).

In the quantitative analysis, two links (FC→BI and FC →UB) of the revised UTAUT model were investigated. The relationship between FC to Behavioural Intention (BI) was a non-significant link. This is an unexpected finding and is inconsistent with the findings of Venkatesh, Thong, and Xu (2012) who argued that FC influences both BI and UB. According to the quantitative findings. However, the Facilitating Conditions construct

directly influenced use behaviour of ICT rather than behavioural intentions, as predicted by the original UTAUT model (Venkatesh et al., 2003) and other empirical studies (e.g., Alshehri, Rutter, Smith 2019). Hence, FC was the only exogenous factor that predicted teachers' actual use of Information Technology in a positive way. The surveys showed that technical support and appropriate resources facilitated the use of ICT in teaching practice. This finding is fully consistent with the modelling results for UTAUT and Hu, Laxman, Lee (2020) in studies on academics' adoption of emerging mobile technologies.

The findings revealed that most teachers did not believe they had appropriate equipment or support, which was found to be a significant cause for not using technology. These findings also suggest that the infrastructure in Algerian Higher Education has not yet been sufficiently established to support ICT use in classrooms.

This negative response was echoed in the interviews, which revealed that even when equipment was accessible, it was in poor condition, the Internet connection was bad, or the informants lacked the skills to operate it. For instance, the Ministry of Higher Education's Pedagogical Platform of Moodle LMS was barely used and there was a severe shortage of support for many teachers on how to use it pedagogically especially with unexpected spread of COVID-19 pandemic. In this respect, several teachers were able to get out of these problems only by bringing their own equipment and materials. Teachers are unable to set homework online using for example the aforementioned educational platform if some teachers themselves or their students are living in shadow areas with the lack or total absence of Internet connection. Hence, the qualitative findings can partly clarify this apparent contradiction, as the majority of interviewees noted that just offering a resource does not guarantee its use, and that teachers should be given guidance on how to use technology for effective teaching as well.

This result may be because according to Venkatesh et al. (2003), facilitating conditions have a positive relationship with technology usage. In earlier models such as Theory of Planned Behaviour and the Decomposed Theory of Planned Behaviour, Facilitating Conditions predicted intention when Effort Expectancy is unavailable. However, in the Model of Personal Computer Utilisation and the Innovation Diffusion Theory, the prediction of facilitating conditions' influence on behavioural intention is not significant (Venkatesh et al., 2003). Where an individual believes that support to use technology is unstable, there will be a negative and significant influence on the intention to use

technology. However, where the support is consistent, the expectation is that Facilitating Conditions will directly predict and positively influence use behaviour. Despite the fact that the results showed that Facilitating Conditions had no significant influence on the teachers' intention of using Informaton Technology, teaching experience moderated the relationship between Facilitating Conditions and Behavioural Intention for using ICT among the teachers, with the effect increasing as the teaching experience decreased.

Hence, there is somewhat of a contradiction in previous studies concerning the relationship between FC and UB. However, this study found that FC is a positive and significant predictor of UB ($p < 0.05$). It is consistent with the findings of other researchers (García Botero, Questier, Cincinnato, He, Zhu 2018; Shah, Khan, Khan, Khan, Xuehe 2020) ,but it is inconsistent with the findings of Khan and Qudrat-ullah (2021) ,who conducted their study on the teaching staff of the Eastern Province of Saudi Arabia, and reported a different finding, as Facilitating Conditions (FC) and availability of resources were the most significant predictors influencing the teachers' behavioural intention to adopt the Learning Management System (LMS), although this may be because Khan and Qudrat-ullah' (2021) informants were limited to one teaching programme at one province of the country. Of the five UTAUT's independent variables (i.e., PE, EE, SI, FC, ATUT), FC provides the highest (0.272) contribution to teachers' actual use of ICT.

The interactive effects of technology experience were included in Venkatesh et al.'s (2003) study, and the present study further examined the impact of the teachers' teaching experience. The findings revealed that only teaching experience moderated the relationship between facilitating conditions and behavioural intention for using ICT among the EFL teachers, with the effect increasing as the teaching experience decreased, which is in line with the empirical evidence presented by Hu, Laxman, Lee (2020) that the teaching experience positively impacted on the relationship between FC and BI. Organisational psychologists have noted that older workers attach greater importance to receiving help and assistance on the performance of their job. The findings also noted that the higher the teaching experience, the stronger the effect of facilitating conditions on behavioural intention,

Of significant interest, the qualitative analysis revealed important issues concerning the facilitating conditions construct, principally that although the majority of the informants reported the benefits of using ICT, some teachers believed that there was infrastructure but

a lack of support such as Wi-Fi and training. The majority indicated that simply providing a resource does not ensure its use, and therefore that teachers should also be informed how to effectively use the ICT for effective teaching. There was no clear guide to use ICT pedagogically. Furthermore, the interviewed teachers made some interesting suggestions, such as taking into account the institution's assistance and the availability of Wi-Fi in classrooms by University Administrators and policymakers. Indeed, teachers acknowledged that concerns about Wi-Fi connectivity were a major factor in their hesitation to use ICT in their classrooms, highlighting the importance of investing in unrestricted and fast broadband access.

The teachers also identified a number of other challenges that impede the use of ICT for academic purposes, including a lack of skills and knowledge in using ICT for teaching, device failure, and the dominance of traditional teaching, as well as a lack of equipment. According to the interview data, four of the six informants lacked sufficient knowledge of how to use ICT applications, with teachers citing a lack of technological expertise and skill in selecting and implementing appropriate technology for effective teaching.

Put it in a nutshell, we may suggest that English as a Foreign Language (TEFL) teachers must enhance their teaching through effective training and skill acquisition in order to facilitate the incorporation of technology into their profession. The informants did not believe they were competent enough to achieve such integration without training. Thus, professional development and ongoing training have become an important part of EFL teachers' professional careers. Because the use of technology in EFL classes is so important, policies need to be implemented to ensure that teachers' professional careers are aligned with knowledge content, pedagogy, and technology (Koehler and Mishra, 2008). According to Godwin-Jones (2015), using technology in the classroom allows language teachers to use networked computers and connect people from all over the world.

It is exciting that FC demonstrated an indirect predictive power on teachers' behavioural intentions to use ICT when moderated by teaching experience. Teachers with less teaching experience were more likely to be influenced by the support in using Information Technologies; an effect that was not influenced by age or gender.

5.1.5 Attitude Toward Using Technology

According to the proposed study model, Attitude toward Using Technology is an individual's positive or negative feeling (evaluative effect) about performing the target behaviour (e.g., using ICT). The notion of attitude represents a set of evaluative responses, including thoughts, feelings, and actions toward an attitude object that has a tendency to be either favourable or unfavourable. Hence, in the context of the present study, attitude toward using technology refers to an EFL teacher's overall affective reaction to using ICT, as a key mediator.

A growing number of studies have tested the predictive power of Attitudes toward Technology on the acceptance and use of technologies (Wong 2016; García Botero, Questier, Cincinnato, He, Zhu 2018; Dwivedi, Rana, Jeyaraj, Clement, Williams 2019; Altalhi 2020; Hoi 2020). It was decided to incorporate this factor as an addition to the original UTAUT Model. Accordingly, the survey questionnaire and subsequent interviews addressed the following question: ***To what extent and why do Teachers' Attitudes toward Using Technology explain variances in the behavioural intention to use ICT in the Algerian Higher Education Institutions (HEIs)?***

Although the questionnaire revealed teachers' overall positive attitudes toward technology, there were a few neutral or negative replies that were thought to be worth exploring further in the interviews. The overall mean of ATUT scale was 4.16, with a standard deviation of 0.627, indicating that teachers' attitudes toward technology use are positive. One of the surprising outcomes of this study was that the resulting revised model found that ATUT was the only single factor that had the most significance in explaining variances in some Algerian Higher Education teachers' intention to use ICT with the standardised coefficient ($ß = .52$, $t=2.79$, p 0.05). Similarly, all six interviewed teachers considered ICT as beneficial. Among the constructs investigated in the modified UTAUT model, attitude toward using technology was found to be the most powerful predictor of teachers' behavioural intention, and to partially mediate the effects of all the exogenous variables on behavioural intention. This finding joined Botero et al. (2019) and Hoi (2020) in lending further empirical support to Dwivedi et al. (2019) position that opting attitude out of the original UTAUT model by Venkatesh et al. (2003) significantly diminished the predictive power of the model.

The results suggested that Algerian EFL teachers had positive attitudes toward using technology in their classrooms, which corresponds with the findings made in previous research studies (Laabidi 2017;García Botero, Questier, Cincinnato, He, Zhu 2018; Hoi 2020; Makhlouf, Bensafi 2021). The quantitative findings show that *Attitude toward Using Technology* was positioned as the strongest predictor of the behavioural intention to use ICT when teaching EFL, although attitude toward using technology did not appear to predict the teachers' actual use of ICT for teaching practices. The qualitative findings only explain this apparent contradiction in part. Some of the interviewees explained that although they believed the enjoyment component to be crucial to their use of technological devices, privacy when using ICT in the classrooms was an issue for some, as discussed later in this section. Nevertheless, the current study finds that attitude toward using technology had a significant effect on behavioural intention, but did not report differences in respect to gender, age.

Unlike Dwivedi et al. (2019), however, it was found in this study that attitude did not directly influence the use behaviour of the teachers; rather its influence on the use behaviour was fully mediated by teachers' behavioural intention to use ICT. This is consistent with the findings of García Botero, Questier, Cincinnato, He, Zhu (2018) and later Hoi (2020).These findings implied that once teachers became aware of the effectiveness of Information Technologies and the ease with which they could use them for language teaching purposes, as well as the availability of the technical and organisational supports and the influence from others, they would form a positive attitude toward and subsequently the intention to use ICT.

The literature suggests that perceived enjoyment is a positive predictor of user intentions for using ICT. The qualitative analysis in this study supports the quantitative findings, as the informants noted that enjoyment is crucial for using technological devices. The informants also identified that fun and enjoyment lead to further exploration of technology use and that the convenience of accessing ICT in the classroom contributed to their enjoyment. Hence, both the quantitative and qualitative findings suggest that the more the teachers enjoy using ICT while teaching, the more likely it is that their attitude toward adopting these technologies will be positive and they will have enhanced motivation to engage with ICT enabled teaching activities. Thus, the results in both phases of the present

study have confirmed that EFL teachers who are intensely involved in technology are more willing to accept the technology due to the enjoyable experience they had in the past.

As this study aims to understand teachers' perceptions of ICT, the acceptance of ICT by individuals is critical to its successful implementation, and this acceptance is impacted by personal perceptions.

Experience moderates the relationship between attitude toward using technology and Behavioural Intention. This research, therefore, advances awareness of the impact of differences in years of teaching experience on ICT usage in classrooms. Understanding these differences can help in developing superior strategies, systems and policies that can assist teachers to better participate and improve their teaching experience. It should be noted that there is limited research on the impact of individual characteristics such as teaching experience differences on ICT use in Algeria.

The findings of both phases of the study answer the research question by demonstrating that teachers' *Attitudes Toward Using Technology* is a significant factor in explaining variances in Algerian Higher Education teachers' intentions to use ICT and that the reason is that they believe it will benefit students' learning and provide faster access to information as long as adequate equipment and support are available.

5.1.6 Behavioural Intention (BI)

According to the proposed study framework, Behavioural Intention is 'the EFL teacher's readiness to perform a specific action or behaviour'. This means that the higher the behavioural intention to perform a specific behaviour, the more likely it will be carried out. Apart from Performance Expectancy, Behavioural Intention was the only factor in the UTAUT that was identified as being consistently shown in the literature to significantly predict the acceptance and use of Information Technologies. This was revealed to be the case in a meta-analysis of the UTAUT literature conducted by Khechine, Lakhal, Ndjambou (2016) and later by Dwivedi, Rana, Tamilmani, Raman (2020).

Behavioural Intention was tested in the questionnaire and further explored in the semi-structured interviews to determine whether and how it affected the actual use of ICT; and addressed the research question: ***To what extent and why does Behavioural Intention explain variances in the use of ICT by Algerian Higher Education teachers?*** The questionnaire contained four questions about teachers' intentions to use ICT. The purpose

of these questions was to distinguish between what the teacher intended in theory and how that intention manifested itself in practice. The overall mean of the BI scale was 4.24 with a standard deviation of 0.6831, indicating that the teachers' behavioural intention to use ICT and willingness to encourage others to do so effectively is very high. This factor was shown to be significant in explaining the variance in Algerian Higher Education teachers' use of ICT with the standardised coefficient ($ß =.41$, $t=2.06$, $p <0.05$).

The findings of the qualitative data support the quantitative findings, showing that all the informants tended to use ICT and were willing to use it throughout their teaching practices. They acknowledged the potential benefits of using this technology if they were given support and encouragement by the Universities, and hence emphasising the significance of well-thought-out policies. If the Universities and policy-makers provide the required support, there is a willingness and motivation for using Information Technology when teaching EFL, supported by the results of facilitating conditions discussed above.

Furthermore, the qualitative findings of the current study show that the use of educational technology in classrooms is dependent on the teacher's readiness, which, in turn, is strongly influenced by University readiness. This is in line with findings by other researchers (Petko, Prasse, Cantieni 2018), who have shown the strong impact of school readiness on teacher readiness in regard to the effective use of ICT in classrooms. These findings are also supported by another more recent study on the experiences of EFL teachers from the Department of English at Hassiba Benbouali University of Chlef which revealed that the urgency of the sudden shift to online teaching during the time of COVID-19 pandemic necessitated teachers' readiness and acceptance of technologies (Makhlouf, Bensafi 2022). From a practical standpoint, this leads to the following conclusion: both teacher and University readiness need to be addressed in order to support the use of technological resources in classrooms. Teacher readiness is founded on the conviction that educational technology is advantageous to teaching and learning, as well as on the notion that one has the necessary abilities to use these technologies in the classroom. Almost all research on educational technology integration in Higher Education Institutions throughout the world has emphasised the importance of these core factors. Thus, teacher readiness and University readiness are the key driving forces behind the adoption of Information Technologies in classrooms.

Phase Two of the research reflected the results of Phase One in that the majority of teachers showed their readiness and intentions to use ICT as part of their teaching and encouragement of other teachers to use ICTs as well. Furthermore, the caveats included in the responses of those who stated that they fully intended to use ICT revealed that a lack of support and training, as well as poor facilitating conditions, were their major issues. The very high response rate (73.3%) to the questionnaire and the willingness of informants to be interviewed (29 out 33 EFL teachers offered themselves as participants in Phase Two of the study) may reflect teachers' interest in using ICT.

5.1.7 Actual Use of Information Technologies

According to the proposed study model, use behaviour is simply the adoption and use of ICTs. This section discusses the actual practices and use behaviour of teachers when teaching EFL. The survey revealed that ICT and different applications are frequently used to teach EFL, with the teachers particularly using projectors as the most available appliance at the level of the University for EFL teaching through their use of mobile devices. Furthermore, the majority of the teachers reported that they frequently used laptops and computers to teach English and all of them stated that there is a total absence of Internet connection in classrooms at the Faculty of Foreign Languages. A high proportion of the teachers reported that they frequently used ICT for 2–4 times per week on their mobile devices to teach or support EFL teaching. Regarding the ICT usage, the qualitative findings indicated that the majority of the informants were using ICT applications such as PowerPoint, audio and video to encourage their students to practise their English language either inside or outside the classrooms. Thus, the qualitative findings corroborate the quantitative findings in regard to teachers' actual use of ICT in teaching practices.

Discussion of Other Findings

This section discusses other significant findings which do not directly address the research questions. In response to the last open-ended question of both the questionnaire and interviews, informants were asked about the points they would consider as enablers or barriers for the use of ICT in their teaching practices.

To gain more in-depth information, the teachers were also asked an open-ended question at the end of the questionnaire to respond in writing comments they considered

other factors as enablers and/or barriers hindering the use of ICT in classrooms. Based on their responses of the survey question concerning the perceived barriers to the adoption of ICT, the lack of technology resources, a lack of training, lack of technical support in the class, and the absence of the Internet connection were the major four hindrances. Teachers also mentioned that lack of knowledge and skills regarding ICT use hindered them from using ICT for teaching purposes.

Comments from the interviewed informants also revealed that lack of ICT training and lack of ICT infrastructure are different barriers preventing them from adopting or using ICT. Most of the informants believed that they needed more training on ICT skills. This finding was supported by answers to the final question of the questionnaire: What do you believe are the main hurdles with using ICT at your University? Please, *add any comments that would encourage your use of Information and Communication Technologies (ICTs) in the classroom; and/or anything you feel discourages you from using technologies*. Passed on the response of this question by the informants' these barriers to ICT adoption and use mentioned by the informants are very much in line with the barriers discussed in the literature review. The results indicate that lack of training and lack of ICT equipment, lack of Internet access and/or poor bandwidth are the major hindrances experienced by the informants for ICT use at the University of Chlef. These findings are supported by other researchers (Percy, Van Belle 2012; Laabidi, Laabidi 2016; Makhlouf, Bensafi 2022).

Additionally, interview findings suggested that other factors, such as a lack of facilities, technical breakdowns, absence of the Internet connection mainly in shadow areas and issues with resource provision, tended to impede teachers' use of ICT in their classroom teaching practices. This study has also shown the complexity of teachers' use of ICT in classroom practice. This complexity manifested itself through teachers' perceptions of the impact of factors that came from different sources such as the teachers, the students, their colleagues, the technicians, the Administrators and the technology. Thus, the qualitative findings corroborate the quantitative findings. Thus, the corroboration of these findings adds more urgency to the need to find solutions to the poor technological infrastructure which exists in some Arab countries.

5.2   Revised UTAUT Model and the Relationship between the Constructs

The answer to Research Question 3: *How can the Unified Theory of Acceptance and Use of Technology (UTAUT) Model be used to better understand what Algerian Higher Education teachers perceive they need to effectively adopt and use ICT?* was addressed by using a proposed revised model of the UTAUT, which was felt to reflect the Algerian Higher Education context. The model was developed from the original UTAUT (see fig 5.1), and is shown with the significant factors that explain the variance in BI and UB; the standardised coefficients are shown for each (see fig.5.2). The factors are positioned in rank order of the significance of the standardised coefficients.
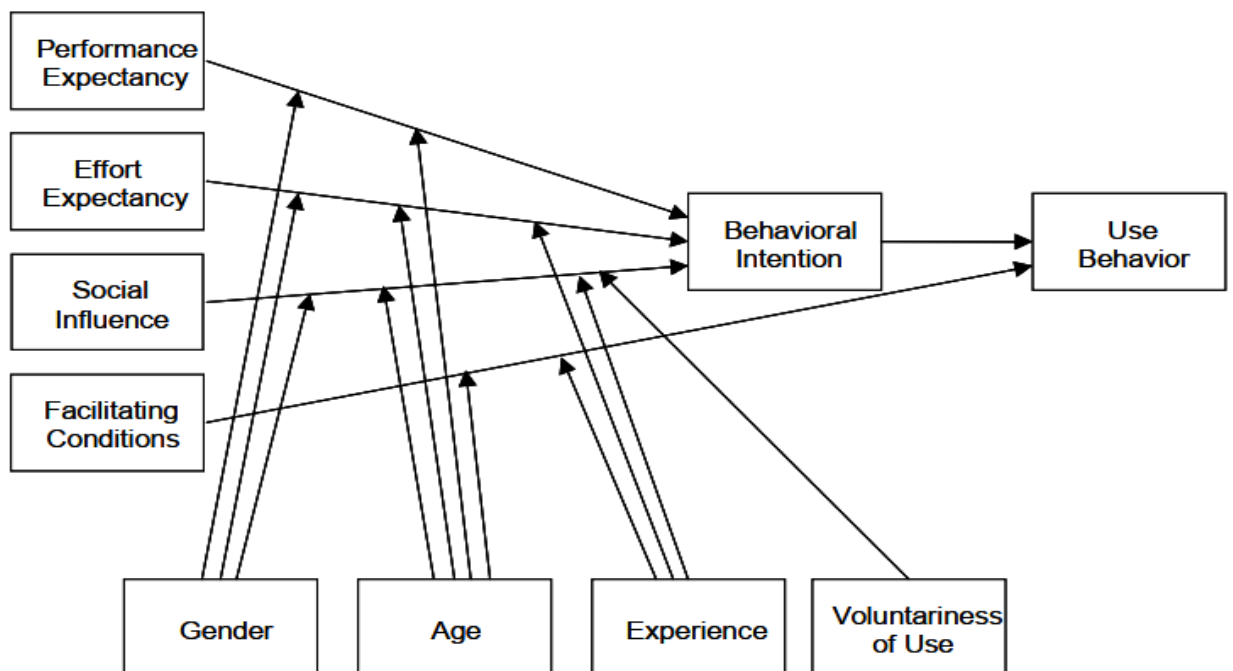
Figure 5.1 Original UTAUT Model (Venkatesh, Morris, Davis, Davis 2003)
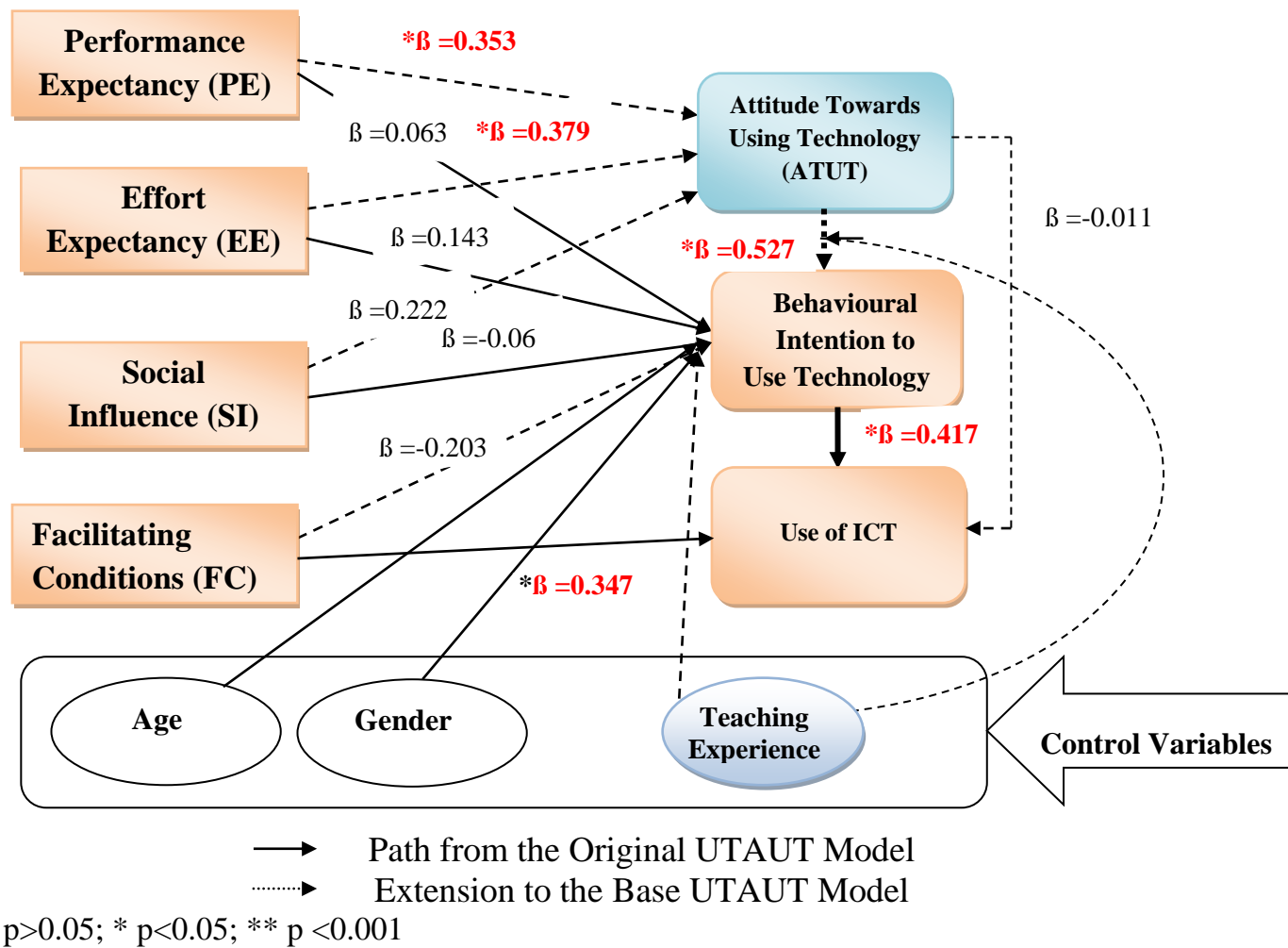
Figure 5.2 Schematic Diagram Showing Study Findings Using Modified UTAUT Model with the Inclusion of Attitude Construct

The study has confirmed that the constructs used in the original UTAUT model are useful in explaining intention to use Information and Communication Technologies and their actual use, especially Facilitating Conditions, which was revealed to be a powerful factor in explaining Use Behaviour in the context of a developing country which still has a way to go in providing the infrastructure and resources which most Higher Education Institutions in the West enjoy. Similarly, Teachers' Attitude Toward Using Technology had a high level of influence on Behavioural Intention. However, more constructs were needed to adequately explain BI and UB within the Algerian Higher Education context. In terms of explaining BI, the study shows that the additional constructs were able to shed further light on teachers' intentions than the original model had and that the cultural context (which shapes teachers' attitudes) as well as teachers' perceptions of education policy is shown to be especially important.

However, both phases of the study revealed that there were further influences on Algerian University teachers' acceptance and use of ICTs that merited consideration; notably: age, gender, technology and teaching experience, and ICT skills. The implications of this are explored later in this Chapter.

- **Relationship between Constructs in the Revised UTAUT Model**

Furthermore, the investigation of the factors in the extended UTAUT model's correlations generated some intriguing findings. In terms of the statistical correlations yielded by Phase One of this study, each of the five psychological constructs was shown to be related directly or indirectly to behavioural intention and actual use of ICT in EFL classrooms through the meditation of the new added construct of '*Attitude toward Using Technology*' to the original UTAUT Model. Hence, some of these relationships are explored below because they point to areas that need to be investigated further in order to acquire a better understanding of the intention to use and actual use of ICT in the Algerian Higher Education.

Both of the two phases of the study show that the great majority of the Algerian EFL teachers at Hassiba Benbouali University of Chlef have a positive attitude toward the use of ICT, despite the obstacles that impede their effective use. Teachers' acceptance and use of ICT have been shown to be influenced by some of the key factors in the revised UTAUT model. Surprisingly, the findings have demonstrated that Performance Expectancy and Effort Expectancy are not significant predictors of the intention to use ICT. These results seem to be inconsistent with the findings that suggest that both Performance Expectancy and Effort Expectancy were significant predictors of the intention to accept and use ICT. However, the manner and extent to which each factor has influence are not always obvious in the existing literature.

For instance, there is a relationship between Effort Expectancy, Performance Expectancy, Social Influence, Attitude toward Using Technology and Behavioural Intention to use, but these factors do not significantly predict variance. However, when we look at Social Influence separately, we find that it does not have influence on other factors which in fact necessitates further investigation. For example, Higher Education Institutions have been shown to play an important role in clarifying the expected benefits of using ICTs mainly through the guidance of teachers' colleagues for providing a clear picture of the use of these technologies which helps to alleviate anxiety and reluctancy about use.

Performance Expectancy was shown to be non-significant in explaining variance in Behavioural Intention to use, but rather it significantly predicted teachers' *Attitudes toward Using Technology*. However, the expected benefit of the use of ICT in the process of teaching and learning is influenced by the level of equipment and infrastructure in institutions, which impacts on the teacher's use of technologies, and helps to reduce the effort in the use of technology. The expected benefit of using technological tools is also linked to the teacher's previous educational experience.

When it comes to the expected effort in deploying technological techniques, the findings of this study and the correlations discovered show that there are multiple factors at play, including Facilitating Conditions such as equipment availability, support, and training. Teacher's years of teaching experience influences ICT skills and knowledge of how to use digital tools in a pedagogical environment, which influences how easy it is for teachers to use ICTs. Furthermore, if teachers view these technologies to be easy to use, this will enhance their Attitudes and their Performance Expectancy; conversely, if they are perceived to be difficult, this will raise hesitancy.

Furthermore, Facilitating Conditions was found to be the most influential exogenous factor on the actual usage of ICT in some Algerian Higher Education Institutions, and it was statistically related to other factors in this study. This illustrates that providing equipment and technical support, as well as enhancing teachers' attitudes about the use of technology in the classroom, is the first step toward successful ICT adoption in institutions. The positive impact of the Facilitation Condition concurs with the findings in the literature that Facilitating Condition predicts the adoption and use ICT in teaching purposes. This indicates that providing the appropriate facilitating conditions, such as technological and management infrastructure, can have a positive influence on the uptake of ICT.This is also an indication that the creating of enabling environment by the higher authorities will encourage and assist teachers' actual use of ICT in classroom teaching practices. However, it has become evident that simply supplying Institutions with ICT would not be sufficient for efficient usage , unless regular training opportunities for teachers on how to use these technologies pedagogically, are provided, as well as effective maintenance of equipment and updated systems. Accordingly, this factor has turned out to be linked to the University surrounding environment.

Additionally, Social Influence was not found to be a positive significant determinant of the intention to use ICT. This is in contrast to previous research, which found that Social Influence is a key predictor of the intention to use ICT. These contradictory findings in the literature on the influence of Social Influence on the behavioral intention to use appear to suggest that the Social Influence (opinions/views/ experiences) from friends, colleagues and family may not necessarily lead to the acceptance and use of ICT.

Ongoing Training opportunities and professional development has been shown to play a key role in the use of ICTs. Learning with ICTs and being trained in their use in the teaching and learning process has a positive impact on later use of these technologies, in addition to knowledge about their benefits as well as being perceived as easy to use and having the ability to deal with any small technical issues. Technologically speaking, teachers in both phases of the current study expressed their intention and enthusiasm to use ICT in their teaching practices but, if no functioning equipment is available, their skills may decline over time. Furthermore, it was discovered that elderly teachers generally had very little training in the use of technology during their teaching career. As a result, they lacked the necessary skills to use ICT in their daily profession.

Reluctance was shown in this study to influence intention negatively to use technologies, it does this by negatively influencing PE, EE and ATT. Clearly, if teachers are reluctant about using technology any benefits they perceive to have, will be outweighed by reluctances about using it. Also, equipment will not be perceived as easy- to-use if teachers are reluctant and anxious about using it. Even if teachers have positive attitudes toward using technology, they will not feel positive if the technology causes them anxiety.

The present study revealed that despite the Ministry of Higher Education encouragement to use of technology, there was a lack of clear vision among teachers about the use of ICTs in their teaching practices, in addition to the lack of necessary equipment for implementation. A lack of implementation of policy has resulted in the unevenness of equipment between Institutions, which means that when teachers move from one institution to another, they are potentially unable to use ICT as the second Institution does not provide the necessary resources. This situation necessitates a resort to the use of traditional methods of teaching, or teachers must provide their own equipment if they want to use ICT in their teaching practices. The next part of this chapter presents an overview and a summary of the main outcomes of the study, outlining first the theoretical, then the practical

contributions, and finally implications drawn from the findings. It also acknowledges the study's limitations and provides recommendations and suggestions for future research.

Section Two: Contribution, Implications, Recommendations and Conclusions

The previous section of Chapter 5 presented and discussed the main findings of this mixed methods study. The second section of this Chapter summarises the main findings, provides answers to the research questions and presents the contributions to knowledge of this research in terms of theory and practice. It also presents the implications of the study for policymakers and for practitioners while highlighting its limitations.Besides, it makes several recommendations and suggestions for possible future research , and the thesis concludes with final remarks.Finally,this chapter ends with a reflection on my doctoral research journey.

5.3 Research Overview

The study set out to investigate the factors that influence teachers' acceptance and use of Information Technology in teaching English as a Foreign Language (EFL), in an effort to determine the level of acceptance of Information Technologies in teaching among EFL University teachers at the Department of English at Hassiba Benbouali University of Chlef. The first step in conducting this study was to explore the related literature on ICT use in Higher Education around the world, and particularly in some Arabic-speaking nations, while the potential benefits of technologies in language teaching and learning were also identified. This review drew to a close by exploring academic studies on the acceptance and use of ICT in education, and reviewing technology acceptance theories and models, with the focus placed on the UTAUT model, which provided guidance to enable the researcher to refine the plan of the study and formulate the research enquiry. The study attempted to answer three main research questions.

RQ 1: What are the factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education Institutions (AHEIs)?

Thus, this question devolves into a number of ensuing questions that need to be investigated through primary research, as follows:

> ➤ To what extent (if any) do independent variables (EE, PE, SI, and FC) affect teachers' attitudes toward using technology at HEIs?

➢ To what extent (if any) do independent variables Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Teacher Attitudes toward Using Technology (ATAUT) affect teachers' behavioural intentions to use ICT at AHEIs?

➢ To what extent (if any) do EE, PE, SI, FC, ATAUT and behavioural intention (BI) explain variances in the use of ICT at HEIs?

RQ 2: How do teachers' socio-demographic variables, namely age, gender, technology and teaching experience moderate the effects of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, and Attitudes Toward Using Technology on teachers' intention to use ICT?

RQ 3: How can the Unified Theory of Acceptance and Use of Technology (UTAUT) model be used to better understand what the Algerian University EFL teachers perceive they need to effectively use ICT?

To answer these questions, a sequential mixed-methods approach under the umbrella of pragmatic philosophical assumptions was adopted to investigate the factors that influence the Algerian EFL teachers at Hassiba Benbouali University of Chlef in the use of Information Technology in their teaching practices. This involved quantitative and qualitative data collection and analysis by an online questionnaire survey and individual face-to-face semi-structured interviews, respectively, with informant teachers. The revised UTAUT model with the inclusion of attitude was used as a guiding theoretical framework for the exploration in this study. The relationships between the different socio-psychological variables in the extended model formed the basis for the underlying hypotheses of the study. Data was gathered to statistically test the strengths of the relationships in the model, and thereby assess whether the hypotheses were disapproved, or accepted.

The current study aimed at filling a knowledge gap by studying all the psychological factors of the revised UTAUT in single research to explore the relationship between the UTAUT's predictor variables of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Attitude toward Using Technology (ATUT) and UTAUT's criterion variables of Behavioural Intention (BI) and Actual Use of ICT (Use Behaviour). It also aimed at investigating the effects of these factors on

teachers' use of ICT. Therefore, it seems to us that the analysis of the quantitative and qualitative data and the study's theoretical framework helped to answer the aforementioned questions and test the hypotheses.

All in-service EFL teachers at the Department of English at Hassiba Benbouali University in the West of Algeria were invited to participate, with 33 teachers joining the first survey stage, and six the second interview stage. A range of statistical techniques were employed via the use of SPSS V26 to analyse the responses of the questionnaire. Once the data had been gathered, the researcher generated descriptive and inferential statistics, and used various statistical techniques to analyse the responses. The qualitative findings drawn from thematic analysis via the use of MAXQDA 2020 software were then presented to enable a greater degree of understanding of the findings. The key findings of both the quantitative and qualitative analysis will be summarised in the next section.

5.4   Summary of the Key Findings of this Research

This section of Chapter 5 presents a summary of the main outcomes of the study, outlining the theoretical and practical contributions and implications drawn from the findings. It also acknowledges the study's limitations and provides recommendations and suggestions for future research opportunities.

The key findings of both the quantitative and qualitative analysis of the three main research questions based on the UTAUT model will be summarised in the following three subsections:

5.4.1 Factors Associated to the Algerian University EFL Teachers' Acceptance and Use of ICT in Classroom Teaching

The first objective of this study was to determine the psychological factors that influence EFL teachers' acceptance and use of ICT in EFL classrooms at Hassiba Benbouali University of Chlef. Hence, the corresponding research question was as follows:

__Research Question 1__: What are the psychological factors that influence the acceptance and use of Information and Communication Technology (ICT) in teachers' practices in the Algerian Higher Education?

Overall, the obtained findings of the study revealed that a high proportion of the EFL University teachers at Hassiba Benbouali University of Chlef had a positive attitude toward

using technology in their teaching practices. The revised UTAUT model included Attitudes toward Using Technology, the Behavioural Intention to use and Use Behaviour as dependent variables, and measured the influence of the independent variables: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. The teachers expressed the usefulness, easiness and self-encouragement when using Information Technology in their teaching, while they confirmed the existence of encouragement from their colleagues and little support from their Institutions, such as Wi-Fi Internet connection and training, and they also reported a lack of guidance on how to use the technology pedagogically. Meanwhile, the teachers stated that while Information Technology was not available in terms of the devices and Internet services in classrooms, they used their own devices.

The aforementioned analysis investigated teachers' attitudes, behavioural intention and use behaviour as the dependent variables of the four antecedent constructs. The findings of the regression analysis concluded that Performance Expectancy, Effort Expectancy significantly influenced teachers' *Attitude toward Using Technology* in their teaching. Next, teachers' *Attitude toward Using Technology* was the only predictor of behavioural intention of using ICT. Then, Facilitating Conditions and Behavioural Intention also influenced the teachers actual use of ICT. This goes in line with the findings of the pioneer scholars Venkatesh et al. (2003) who found that Facilitating Conditions and Behavioural Intention of consumers toward technology were the two direct determinants that significantly influenced the use behaviour. Thus, the more teachers have positive Behavioural Intentions toward ICT, the more often they will use the ICT. Then both, the first research objective and research question are tested through hypothesis H1.

It seems to us that there exists a statistically significant relationship among all the psychological variables and the actual use of ICT leading to acceptance of proposed Hypothesis1.

5.4.2 Relationships between Teachers' Socio-demographics and Psychological Factors

Research Question 2:

This study investigated the impact of demographic factors such as gender, age, and teaching experience on the use of ICT. Specifically, the research question investigated were: To ***what extent do the demographic factors such as gender, age and teaching***

experience influence the acceptance and use of ICT and what is the significant impact of these demographic factors on the behavioural intention to use ICT?

This study has found that the EFL teachers' demographic characteristics such as the number of years of teaching, age, and gender had positive correlations with their actual use of 'ICT for teaching purposes'. Personal characteristics played a key role, with the results indicating potential differences among the teachers in terms of their use behaviour and intention to use Information Technology. Age moderated the relationship between performance expectancy and use behaviour, where the influence increased with the teacher's age. Teaching experience moderated the relationship between facilitating conditions and behavioural intention for using ICT among teachers, with the effect increasing as the teaching experience decreased. Teaching experience was also found to moderate the relationship between attitudes toward using technology and behavioural intention, and the effect or influence was enhanced as the teaching experience decreased. Gender moderated the relationship between performance expectancy and use behaviour for using Information Technologies among the EFL teachers, with the effect more prominent among females than males. The results further indicated that experience moderated the relationship between attitudes toward using technology and use behaviour, with the effect increasing as the level of experience decreased. Hence, the fifth, sixth and seventh hypotheses, assuming the moderated effects of gender, age and teaching experience on the relationship among constructs, were partially accepted.

5.4.3 How Factors in the Revised UTAUT Model relate to each other and Explain Variances

This section summarises the key findings drawn from the current study in an attempt to answer the following research question.

Research Question 3: How can the Unified Theory of Acceptance and Use of Technology (UTAUT) model be used to better understand what Algerian Higher Education teachers perceive they need to effectively use ICT?

The findings of the current study concerning the nature and extent of the influence of the different factors in the revised UTAUT model revealed interesting correlations between many of the factors (see section 4.4.1, Chapter 4) and studies to understand this further

would shed further light on the acceptance and use of Information Technologies by Algerian University EFL teachers.

Finally, the revised UTAUT model in the current study explained 47% of the variance in the informants' attitude toward using technology, 50% of the variance in the teachers' behavioural intention to use, and 38.7% of the variance in the teacher's actual use of ICT.

The above key findings of the study are used to highlight the contributions this study has made to existing academic knowledge, to new knowledge and to the context of the research, which are presented in part five below. These key findings are also used to propose what implications this study has in relation to Government policies, guidelines of the University, professional learning and the EFL teachers at the University, which are presented in part six of this chapter.

5.5   Academic Contributions to Theory and Practice

This study draws several contributions for theory, methodology and practice. From the theoretical point of view, the core outcomes of this research are to develop a theoretical research model that allows a better understanding of the factors that influence the users' behavioural intention to use ICT in the Algerian Higher Education Institutions. Hence, the present study has contributed to theory-building in the field of technology acceptance by proposing and empirically testing a model for exploring the factors that influence teachers' acceptance and use of Information Technologies in teaching practices. In this way, it is contributing somehow to academic knowledge in the field of technology acceptance in Higher Educational context. In practical terms, it has also provided a better understanding of the issues that can promote or impede the successful implementation of ICTs, and which may assist education policy-makers and University Administrators and managers to find strategies to achieve this. This applies in particular to the context of developing countries where the situation in Higher Education has parallels to that of Algeria and that of the University of Chlef.

The major theoretical and empirical contribution of this thesis is to test the explanatory power of the extended Unified Theory of Acceptance and Use of Technology model (UTAUT) in the context of using ICT in EFL teaching in Algeria. More specifically and ultimately, the findings from this study could be used to inform education policy initiatives undertaken by the Algerian Ministry of Higher Education. The following are the key theoretical contributions of the current study to the body of knowledge. The individual

contributions are detailed below and are in the order in which they reflect the research questions of the thesis:

Contribution 1: This research has provided a clearer image of the current use of ICT in the context of some Algerian Higher Education Institutions and highlighted the integral role played by demographic variables, surrounding environment and knowledge of ICT skills at the level of University. It is important to have a comprehensive view of what is actually happening in Institutions in order for the Ministry of Higher Education to successfully implement ICT and shed light on the limitations of the previous projects to introduce this into Algerian Higher Education.

Contribution 2: This study has developed and tested a theoretical model of technology acceptance in order to gain a better understanding of the major factors that explain variances in teachers' attitudes toward using technology, behavioural intention to use, and actual use of ICT in classrooms in some Algerian Higher Education Institutions. The model could be applicable in similar settings, such as other Arab countries, and it could be helpful for decision-makers, such as the Ministry of Higher Education, in developing strategies for successful ICT adoption in classrooms.

Contribution 3: The original UTAUT model has been revised to fit an educational context, and it has shown that factors such as teachers' *Attitudes toward Using Technology* influence their behavioural intention to use ICT, and that Facilitating Conditions influence the actual use of technology in classroom teaching practices. This is useful for other researchers who are interested in developing theoretical frameworks for exploring the key determinants for the acceptance and use of technology within their own educational contexts.

Contribution 4: Given the importance of Facilitating Conditions and their impact on Use Behaviour found in this study, these findings can be applied to other fields such as Computer Science and Information Services to determine what type and quality of infrastructure and technical support is required to successfully implement ICT. This is particularly true in developing countries, as well as countries with similar geographical characteristics to Algeria, which face similar infrastructure challenges. More specifically, how infrastructure and technical support problems can be hindrances to the successful implementation of such systems.

Contribution 5: This current study adopted an explanatory sequential mixed method design, where the quantitative method was initially employed, followed by the qualitative method to provide an in-depth understanding of the findings. To the best of my knowledge, no mixed empirical research studies have been conducted on the factors that influence teachers' acceptance and usage of technology in Algerian Higher Education Institutions. Based on the findings drawn from the questionnaire sample and the details provided by the six interviewed EFL teachers, this study has offered a detailed picture of teachers' Behavioural Intention to use and actual use of ICT in EFL classrooms in an Algerian Higher Education Institution in Chlef.

Contribution 6: The addition of Teachers' *Attitudes Toward Using Technology* as an antecedent to behavioural intention within the context of ICT use. This *newly* added variable has previously been suggested as potentially important but had not been investigated thoroughly in empirical work on UTAUT, nor had it been investigated in relation to ICT acceptance. The findings of the current study validate and confirm that *attitude* is an important criterion in the study of ICT acceptance and use. Researchers in the field of education can make use of these findings when considering the acceptance and use of Information Technologies in the context of developing countries where teachers may not have been trained with any digital tools.

This study tries to help better understand the characteristics of the teachers in Algeria, which can help policy makers, educators and experts to understand what the teachers expect from the use of ICT in their teaching practices. This can help the management body achieve the most effective deployment of such technology, and it also helps to improve the strategic decision-making about technology in the future. They can decide on the best approach that fits their teachers before implementing any new technology. Additionally, for the system developer of Moodle LMS, this research also may provide a synopsis of the opinions of some Algerian University teachers on the important factors that influence the acceptance and use of such system which will help them understand how they could improve their learning management systems. Similarly, the users (*teachers*) can understand what motivations and factors drive them into accepting the use of technology in the classrooms.

This study attempts at informing about practice. The findings showed that teachers were more likely to use ICT when they perceived or were convinced that it was a robust,

innovative, easy, and useful tool in their teaching practices. This provides valuable information to instructional designers and educational practitioners in that they need to consider providing experiences with an aim to cultivate positive attitudes before the implementation of technology into classrooms. Policy-makers need to consider internal factors suggested in this study by attending to ways to improve teachers' acceptance of technology. This could be achieved by involving significant others such as experts in the field of Higher Education to share their positive experience with technology in order to persuade potential users of its ease of use and low level of complexity. In so doing, teachers' attitudes and perceptions of behavioural control of ICT could be expected to be greatly strengthened thus leading to a stronger intention to use technology.

Therefore, this study may be considered as the first, in Algeria, while it addresses the key determinants of ICT usage among EFL teachers at the level of Higher Education Institutions, resulting in the above-mentioned contributions through investigating ICT acceptance among teachers in Higher Education.

5.6   Implications of the Study Findings

The findings of this study have significant theoretical, methodological and practical implications in the area of ICT adoption in developing countries, specifically in Algeria. In the case of the theoretical implication, this study enriches the literature on Information Technology and related terms by employing the modified UTAUT model. Then, the practical implication provides all stakeholder groups, including academics, University managers and policy-makers, with useful information that can guide and support the implementation of ICT in Higher Education Institutions. These implications are discussed in greater detail in sections 5.7.1 and 5.7.2 below.

5.6.1 Theoretical and Methodological Implications

The UTAUT model has been widely applied in understanding users' acceptance of technology but there have been limited studies that validate the constructs of the UTAUT in ICT usage in Higher Education Institutions within the context of Arab world countries. Thus, this study contributes to the literature on Information Technology in developing countries by testing the UTAUT model within an African Higher Education context.

The findings of this study claim to provide useful insights that University administrations can use to develop strategies to encourage the use of ICT in the Algerian

Higher Education Institutions. From a theoretical perspective, the use of the UTAUT model as a base theory in the educational context and the incorporation of an additional construct ('*Attitude toward Using Technology*'), have demonstrated the applicability of the extended model in the technology-enhanced environment in Algerian Universities. The researcher of this study explored the role of '*attitude*' in the intention and usage behaviour of ICT and observed that attitude plays an important role on the teachers' intention and indirectly the actual use of ICT. The incorporation of an attitudinal factor, as a new predictor of teachers' intention and use of ICT, may be a major theoretical contribution to Information Technology researchers and in particular, the technology acceptance field. The facilitating condition factor emerged to be the most significant factor for teachers to use ICT in Academic Institutions. In this regard, Universities should create strategies for enhancing the organisational and technical infrastructure to support the teachers' use of ICT. Services such as stable Internet connection, timeframe of technical assistance, training provided and resource availability have been suggested as fundamental to the successful implementation of ICT in the classroom.

Furthermore, our research uncovered certain relationships that were not found in the original UTAUT model. Several of these paths identified in our research were due to the introduction of a new construct (i.e., *attitude*) not found in the original model. These paths include EE → AT, PE→ AT, and AT→BI, and offer new insights regarding the intentions and behaviours of individuals relating to the acceptance of ICT. We suggest the inclusion of *attitude* to be an integral part of the UTAUT model in future research studies.

Theoretically, based on the quantitative and qualitative findings, the revised UTAUT model used in the current study produced a substantial improvement in predicting teachers behavioural intention and actual use of Information Technologies in some Higher Education Institutions in Algeria .Therefore, in response to Venkatesh et al.'s recommendations (2003), this research has expanded the applicability of the UTAUT model in a new context (Higher Education in Algeria), to a new user group (EFL teachers) with a new technology (Information and Communication Technologies), thus advancing this theoretical model as presented by Venkatesh et al. (2016).

In terms of methodological contribution, this research tried to demonstrate that the combination of two research tools can also confirm reliability and validity. The mixed-methods methodology used in this modified model of UTAUT can be repeated in future

research studies in Higher Educational Institutions of other regions of Arab world countries. This will hopefully contribute methodologically to future research in the area of ICT use in Higher Education Institutions.

The revised Unified Theory of Acceptance and Use of Technology (UTAUT) Model has been shown to be useful in gaining a better understanding of what some Algerian EFL teachers at Hassiba Benbouali University of Chlef perceive they need to effectively use ICT in their classroom teaching practices. The implications of the study's findings seem to be important and can be viewed also from a different practical perspective that is discussed below.

5.6.2 Practical Implications

The findings from the current study provide a deeper understanding of the significant factors influencing teachers' acceptance and usage of ICT in some Higher Education Institutions in Algeria. Therefore, these factors offer several practical implications that are useful for policymakers, education stakeholders, and teachers, described as follows.

According to the findings of the current study, the first practical implication is related to the new added construct of *attitude* that plays a central role in an individual's intention to use and usage of ICTs. Specifically, attitude has direct and significant effect on teachers' behavioural intentions for the usage of ICTs – which implies that teachers with a positive attitude toward ICT show enhanced levels of intentions toward the usage of ICT in their classroom teaching practices. Thus, education stakeholders should focus on attributes that foster a positive attitude with respect to the effective implementation of ICT by teachers.

Secondly, Performance Expectancy influences attitude toward ICT and influences intentions toward and the usage of ICT indirectly. These results imply that, when teachers consider the benefits of ICT on academic performance, they develop a positive attitude toward ICTs and start using them. Thus, curricula designers at the level of all Higher Education Institutions should encourage teachers to the pedagogical use of ICT that enhances students in their academic performance through effective courses. Educational stakeholders – namely the Foreign Language Teachers – should spread the word about the benefits of using ICTs. Once teachers are aware of the existence and the effectiveness of ICT applications, they can positively influence their colleagues and friends on the use of the most effective technological tools. Advocating for ICT is a stepping stone toward its

acceptance among teachers, given that someone with a high-performance expectancy is more likely to adopt it than someone with a low performance expectancy.

To foster perceived usefulness among teachers, it is suggested that teacher trainers should focus on the functional and pedagogical aspects of technology for teaching and learning purposes.

Thirdly, the expectation of required effort not only influences attitude toward ICT, but also the expectation of performance. These findings imply that by adopting ICTs with less effort and time, teachers will garner a positive attitude toward using technologies and find them effective in enhancing their academic performance such as Moodle LMS user-friendly interfaces. Therefore, this result guides Moodle developers and designers to focus on teachers' needs, reducing teacher effort required to use educational technologies, ensuring that ICTs are easy to navigate, and providing a user-friendly system.

Fourthly, Social Influence does not have direct effects on attitude and behavioural intention of using ICT. This implies that teachers do not develop a positive attitude toward ICTs if they are not encouraged by their colleagues, and administrators at Universities. Therefore, stakeholders and educators should spur on teachers to participate in training programmes for a better pedagogical use of technology. In addition, Moodle developers and designers should add social spaces in Moodle Platforms in the form of discussion forums with integrated audio and video options. Social features in Moodle environment can facilitate teacher interaction with other colleagues and other students.

Fifthly, Facility Conditions have a direct influence on teachers' use of ICTs. Thus, Universities could effectively promote teachers use of ICTs by providing them with essentials such as computer laboratories, high-bandwidth Internet connection, and technical support, and organising training programs on the use of ICT pedagogically. Alternatively, governmental entities can deploy strategies to make anytime-anywhere connectivity more plausible for teachers and students. Providing classroom free-access Internet connectivity would result in more ICT opportunities. From a pedagogical standpoint, knowledge gained from the conduct of the current investigation is of paramount importance to University academics to cope with new emerging teaching approaches that foster their use of ICT-based instruction. Teachers can take advantage of the benefits of the ICT when providing students with learning materials, announcements, feedback. In fact, Algerian Higher Educational Institutions have introduced Moodle LMS as a

pedagogical learning platform for the benefits of teachers and students. The platform offers a variety of support options, including the creation of online courses. These initiatives offer significant support to educators, not just in terms of instructional design but also in terms of understanding online pedagogy. Teachers will subsequently have a greater understanding of the technology skills needed to support online learning. Practically and pedagogically, Higher Education Institutions or Faculties need to provide sufficient support to encourage the successful implementation of ICT by Faculty members and to ensure the continuity of inclusion of ICT during teaching and learning process to reinforce a positive attitude.

A final implication drawn from the findings of the current study was the great willingness of EFL teachers for more training opportunities. Hence, the Ministry of Higher Education should ensure that all teachers receive adequate training. This measure would be part of the human professional development, which is essential for the technology implementation. Training should not merely focus on ICT literacy skills but also present ways to integrate ICT in teaching and learning process. With such training, teachers can act as agents of educational change within their institution. Accordingly, as teachers use ICTs more, they tend to incorporate them in their classroom teaching practices. Therefore, teachers should be trained on how to integrate technology in language teaching. If teachers possess advanced knowledge of ICT skills but do not manage its integration into pedagogical practices, this could impede rather than foster the learning process. For this reason, in-service trainings can be organised and teachers become more skilled and use ICTs in their classes. However, some limitations were identified and are discussed in the subsequent section.

5.7   Limitations and Future Research Directions

The current study has some potential limitations that need to be identified and discussed. First, the thesis has pointed out that the target population for this study was only limited to the sample of EFL teachers from a single State University located in the Western part of Algeria, Hassiba Benbouali University of Chlef. Therefore, it was also highlighted that the findings, interpretations and conclusions drawn from the study were only restricted to the case and sample under study, limiting the generalisation of the findings to other areas or State Universities. Hence, the findings of the study may not provide an adequate reflection of the attitudes toward the use of ICT by the entire teacher population of Algeria.

Areas of future research, therefore, could focus on a wider scope, include other Higher Education Institutions such as Eastern, Central, Western and Southern parts of Algeria and include other contextual factors such as technical support, culture, and other socio-economic factors in order to produce a model that is more generally applicable. The research did not also include learners, administrators, managers and policy-makers who could have given the study a more balanced picture of what is happening toward the adoption of ICT in the Algerian Higher Education System. This point will be raised in recommendations and suggestions for further research in this chapter (See section 5.8.2).

Second, this study involves a one-time data collection (cross-sectional). In the future, longitudinal studies could be conducted for better observing and evaluating the changes in the variables influencing the teachers' Behavioural Intention to use ICT in their teaching practices. This is because teachers' perceptions and preferences about technology may change over time as they gain more experience in ICT. It is also important to keep in mind that technology acceptance models such UTAUT do not represent processes or sequences of events. To capture the sequence of events of an implementation process, data must be collected at different points in time – before, during, and after the implementation of ICT. Hence, the conduct of longitudinal research studies on actual use of ICTs by in-service teachers would throw more light of predictors of ICT usage and purposes for which the ICTs are used by the teachers.

Third, the current study also investigated the use of ICT in a context where it is voluntary for teachers to use the technology. Thus, future work should investigate teachers' attitude toward using technology in a context where it is simply mandatory to use for instance Moodle LMS. The study was conducted using a mixed method methodology. Therefore, future research could use a variety of methodologies (interviews, qualitative methods, classroom observation, and longitudinal study) to produce more insights on teachers' actual use of ICT. Finally, other research frameworks can be tested to investigate other factors that might be significant in determining behavioural intention of students to use ICT. For example, the UTAUT 2.

While there were several limitations to this study, these limitations did not eliminate its usefulness; rather, they provided an impetus for future research in the area of the determinants of ICT usage by teachers as a whole. In the next part, we offer recommendations and suggestions for future research in these areas.

5.8 Recommendations and Suggestions for Future Research

In view of the findings derived from this research study and the implications arising from them, the following recommendations can be made for consideration. They are related to strategies that policy-makers and stakeholders in Higher Education Institutions can use for future development and that researchers can use if they are interested in conducting additional studies about ICT in the Arab world in order to provide a greater wealth of knowledge in this area. In light of this, the recommendations are made and grouped into two micro and macro levels for possible enhancement of ICT implementation at Higher Educational Institutions. Quill

The first level, macro-level, includes recommendations for the administrators of Higher Educational Institutions, LMS designers and policy-makers at the level of the Ministry of Higher Education (MoHE) while the second level (micro-level) recommendations are for teachers and researchers. Based on the findings of this study, the following recommendations suggest measures to promote ICT acceptance and use in the Algerian Higher Education Institutions.

5.8.1 Macro-Level: Recommendations for Administrators and Policy-makers

1. Providing Required Technical Support and Facilitating Conditions

The current study highlighted that *facilitating conditions* (FC) and availability of resources are two of the most significant predictors influencing the actual use of ICT by EFL teachers. Teachers are discouraged from using ICT in Higher Education Institutions (HEIs) due to a lack of required resources and facilitating conditions. Therefore, HEIs should consider providing all necessary technical support and facilitating conditions, such as offering training workshops on ICT use in teaching purposes. The administrators should facilitate the quick access of teachers to the resources needed for the better use of ICT. In addition, walk-in professional development seminars on educational technology, online courses, and technology-related topics could be organised for the benefits of all teachers of Higher Education Institutions. This will enhance their level of comfort in using ICTs in teaching practices with the availability of technical support and ongoing workshops. Thus, the policymakers may need to take into consideration well-organised initiatives to provide adequate technical support, resources, and training to the teachers of the Higher Educational Institutions to boost the ICT use. The findings and recommendations of this

study will help the Ministry of Higher Education and Higher Education administrators to re-evaluate their current practices. This, in turn, will improve the teachers' perceptions about using the ICT in their teaching practices.

2. Provision of More High-Quality Online Resources and Guidance Centres

The majority of the teachers agreed that there is no sufficient technical support available for the teaching staff. In case of any problems, the teachers waste a lot time trying to resolve the technical problems first. Due to this trial and error troubleshooting, the teaching and learning process suffer a lot. Teachers are obliged to turn to plan B. It is highly recommended from policy-makers to develop a regular and well-resourced technical support centres throughout all Higher Education Institutions for the benefits of the teaching staff.

One of the more notable findings of the current study was that many teachers had not heard of the benefits of Moodle LMS until the outbreak of COVID-19. There were many criticisms of the use of Moodle due to the lack or total absence of Internet connection and poor equipment sometimes made it even more difficult. It might be possible for each institution to have a high-bandwidth Internet connection system at the suggested technical support centre that allows free access to multidisciplinary teaching materials to be uploaded or downloaded by both teachers and students. As the materials are downloaded onto the Moodle LMS system, reliance on the Internet is guaranteed. This study revealed that currently in Algerian Higher Education and especially with ongoing circumstances with COVID, all courses are generally downloaded at the University's Moodle LMS that need to be used by students for the continuation of their learning. Having an Internet system as described above would solve this problem if the required equipment was located in classrooms. It is essential that resources provided should be of high quality and accompanied by guidance notes as to how the material can usefully be integrated into lessons.

The recommended technical support centre should offer training on how to troubleshoot basic technology problems. In this sense, establishing a link between coordinator positions is proposed in order to create bridges between technical personnel, departments, teachers, and students. It is also recommended that teachers could be

motivated and assisted with incentives such as hand-held projectors and laptops for providing high-quality content.

3. Provision of Digital Literacy Training Centres for Novice Teachers

In order to employ Information Technologies pedagogically, novice teachers in various departments at the level of Higher Education Institutions must be trained. This training enhances teachers' better understanding of the capabilities of using technology in their teaching practices. Furthermore, they must learn how to properly incorporate such technologies into their classrooms, as this study has shown that having knowledge of ICT skills alone may not be adequate for effective ICT use. Though, the newly recruited teachers at all Higher Education Institutions in Algeria are receiving online training from the University of Constantine on how to teach online, they indicate that it is not sufficient because it focuses more on the technical and neglects the pedagogical side. I think that creating a regional centre for training teachers under the supervision of specialist research group based in Algeria would contribute to building a knowledge base and will contribute to a better understanding of the relationship between EFL teachers and ICT in the Arab world. It is highly recommended from policy-makers to offer training opportunities for both older and newly recruited teachers on how to use technology pedagogically through theoretical and practical sessions by establishing training centres in different parts of the country.

4. Clear Education Policy on the Use of ICT in Higher Education Institutions

Higher Education Institutions need to have a clearly documented policy on the use of ICT that is distributed to all Faculty members. The policy needs to include sections about in-service training in the use of Information Technologies and resources, the proper evaluation of this training so that it can be updated and improved and the monitoring of teachers' progress. There also needs to be clear guideline for monitoring equipment and reporting any problems. The Ministry of Higher Education's clear vision for the successful use of ICT in Algerian Higher Education Institutions would include this University guideline. As a result, the Ministry needs to develop a clear policy for integrating ICT into the educational system. It is insufficient to supply institutions with materials and provide teachers with a few 'one-size-fits-all' technical workshops.

5.8.2 Micro-Level: Recommendations for Teachers and Researchers

(a) Recommendations for Teachers

- **Boosting Best Teaching Practice with ICT through Peer Observations and Workshops**

According to the findings of the current study, University teachers are one of the best resources available for successful ICT adoption. Many informants in this study exhibited resourcefulness in overcoming shortcomings in facilitating conditions, and there was evidence of older teachers receiving assistance from novice teachers in effectively using equipment and technological resources. The study showed that having positive attitudes to ICTs and believing them to be relatively easy to use significantly influenced teachers' behavioural intention to use. The findings of this research lead to the inference that ease of use of ICT is an important factor that influences the behavioural intentions of teachers to use ICT. It is recommended that teachers with positive perceptions of ICT should recommend and encourage other teachers to use ICT in their teaching practices. Similarly, apprehension and hesitancy about using technology had a negative impact on intention to use. Implementing a peer observation system is one possible solution to this problem.

Teachers who struggle with ICTs should be given the opportunity to participate in a peer observation with another teacher who is proficient and expert in the use of ICTs. For instance, this can be done with minimal disruption of the running of the courses if two groups of learners from different classrooms are perhaps put together and team-taught. The teacher would need to provide feedback on whether the experience was beneficial, whether they planned to incorporate ICT into their teaching practice as a result, and whether they needed further peer observation, maybe with them actually using the technological tools.

A further development of this strategy might be best through the organisation of practice workshops. Each Algerian Educational Institution might identify best practices in the effective and pedagogical use of ICT and host a workshop for the benefits of teachers within their Faculties. Attendees could also engage by discussing their ICT-related ideas and experiences. Such workshops would require academic specialists to supervise them and attendees to evaluate them as well as an effective framework in place to do so. Being able to observe other colleagues who teach the same modules using ICT in relevant and entertaining ways may increase teachers' performance expectations of ICT.

Teachers can also be made more aware of the range of digital tools and resources available and select those best suited to their competencies (and those of their students), their University's facilitating conditions, the time available for integrating the technologies into their teaching and any barrier that hinders their use of ICT.

• **Participation in Professional Development Programs**

A high proportion of teachers indicated that there is an urgent need for training on the use of the Moodle Learning Management System (LMS) especially with unexpected circumstances such as the spread of COVID-19 pandemic because they were unaware of many of its new features (Makhlouf, Bensafi 2022). Therefore, these teachers will perceive technology to be hard to use, resulting in the production of avoidance and resistance behaviours concerning the use of technology for teaching and learning purposes. Hence, continuous professional development programs of Moodle LMS tailored to starter and more experienced teachers are strongly recommended at each Higher Education Institution at the beginning of every academic year. The participation of teachers in professional development programs could enhance teachers' skills, knowledge, alternative pedagogical strategies, and emerging educational tools such as LMSs. Findings from this study might eventually assist the decision makers and the Ministry of Higher Education in making informed decisions regarding the training and professional development of teachers that will result in increasing their use of ICT to support the educational process. The professional development of teachers can be characterised as the most crucial factor that sits at the heart of any successful adoption and effective use of ICT in learning processes (Makhlouf 2017). Therefore, the teachers are recommended to participate in professional development programs to model the new pedagogies and technological tools for learning with the aim of enhancing the teaching-learning process.

• **Establishment of Learning Communities**

In teaching and learning environments, teachers are expected to communicate with each other, discuss issues, share the experience of their students, and exchange scholarly work. It is suggested that teachers establish 'learning communities' within their institutions to foster collaborative learning and teaching practices. Learning communities would enhance in improving trust, interaction, and sharing of knowledge of the teachers.

It can be any type of interaction, including face-to-face, social media, or a mix of the two. Teachers can meet on a regular basis to discuss and refresh their technological skills and knowledge, share ideas about current research, and rearrange the courses they teach.

(b) Recommendations for Researchers

- **Adding Other Constructs to the Original UTAUT Model**

The original UTAUT model did not include '*attitude*' construct due to the presence of 'Performance Expectancy' and 'Effort Expectancy'. In this study, the construct '*attitude*' was added due to its good reliability and validity in many recent empirical studies (Makhlouf, Bensafi 2021). Thus,it was found in the current study that attitude towards the use of technology significantly influenced teachers' behavioural intention to use ICT in teaching practices. Since this construct is relevant to the acceptance of ICT, the researchers in the area of ICT usage are highly recommended going beyond the original UTAUT or other technology acceptance models by adding additional contextual, organisational, and individual factors such as social isolation, technical support ,education policy, anxiety and cultural factors for a more powerful explanation of ICT acceptance and to address the barriers that impede ICT continued use. More empirical studies need to be conducted on the interactions among the moderating factors of UTAUT, as to develop a more parsimonious model on ICT acceptance and use.

- **Taking Socio-Demographic Variables into Consideration**

Although professional assistance, institutional support, and psychological factors influence the use of ICT, a clear picture of the inclusion of other socio-demographic variables such as differences in personality factors, academic qualification, curriculum, association, technology awareness, and educational policies, is also required. Researchers are highly recommended to go beyond the original UTAUT by adding additional moderators such as Corona Fear, technology awareness and accessibility and all possible influential demographic variables for a more powerful explanation of ICT acceptance.

- **Conducting Studies in Other Disciplines**

Since this study is the first of its kind in the Algerian Higher Education Institutions, it is evident that more similar studies are highly needed to contribute to the growing body of knowledge in the field of EFL instruction and ICT in the Arab region, a matter closely

linked to economic and social development. Because this study only covered one university, future research can include more institutions and universities in different geographical zones and at different levels to get a more complete view of ICT use in teaching practices. It is recommended that future research be conducted in other disciplines (i.e., other than English as a Foreign Language) or with the same population in geographical settings other than Hassiba Benbouali University of Chlef, Algeria. This would offer a holistic view of how Information Technologies are being used in teaching/learning in Higher Education Institutions, and provide the baseline data necessary for planning courses in classroom teaching practices.

- **Using Different Samples and Methodologies**

    The current research has been conducted only on the EFL teachers, future studies on ICT acceptance and use could be extended by incorporating the perceptions of numerous stakeholders: educational administrators, students, and policy-and decision-makers. I believe in the importance of interviewing policy-makers to investigate their views on the current status of the implementation of ICT in Higher Education Institutions and procedures taken to promote supporting factors and reduce the effect of hindrances. Comparing their visions of the future of education with those of EFL teachers in the present research would reveal interesting comparisons and assist in bridging the gap between policies and preferable futures with the deployment of technology in Higher Education.

    Additionally, future studies can also focus on using focus groups and observational methods for obtaining more comprehensive information about teachers' strategies and techniques for using ICT. Furthermore, researchers can use classroom observation from a targeted sample to conduct in-depth analysis so as to gain more knowledge about teacher experiences. Future studies can also conduct case studies of other Departments within the Algerian Higher Education Institutions.

- **Exploring the Hindrances of ICT Usage**

    The current study aimed at investigating the key determinants of in-service EFL teachers' acceptance and use of ICT in Higher Education. This research also explored some of the barriers that may hinder the uptake of ICT in education. This research has shown that many of the barriers to the integration of ICT in the teaching of EFL can be targeted at the level of the Ministry of Higher Education. First, the non-availability of ICT resources

and lack of technical support have been reported as the main barriers to ICT integration among teachers. It is recommended that future empirical research needs to examine the barriers that impede the use of ICT by teachers in a more in-depth manner at level of other Higher Education Institutions. Research studies focusing on the impediments to ICT use in Higher Education Institutions will aid in identifying crucial areas that need to be addressed for the successful technology implementation.

I would like to highlight that the above recommendations and directions for future research are only proposed to provide an initial platform upon which teachers, as responsible social agents, might have the opportunity to voice their concerns to the policy- and decision-makers in relation to the use of ICT in their daily teaching practices. Therefore, an integral objective of the current research was to provide a channel through which the informants could voice their concerns, and share their lived experiences and perceptions toward the acceptance and use of ICT with other teachers in Algeria and in the Arab world. It is hoped that if this thesis is read by teachers and policy-makers in Algeria, it might lead them to reflect on and to explore further some of the issues raised. To finalise, all the decision-makers should have a road map for the successful implementation of Information and Communication Technologies within the Higher Educational System.

In sum, this piece of research could have an impact on the field of educational research in Algeria, and subsequently may be a step forward to the enrichment of knowledge of ICT integration in Higher Education, not only for Algeria but also for other countries in the Arab world.

It is hoped that the recommendations for strategies for a more successful implementation of ICT into Algerian Higher Education will provide useful directions for policy-makers at both national and regional levels in countries facing similar challenges in establishing ICT that will be welcomed by teachers and be useful to students.

5.9 Final Remarks and Personal Reflections on Conducting Research

The idea to conduct this study comes in line with my interest in the implementation of technology in the Algerian Higher Education. As part of my doctorate programme, I have recently conducted some empirical research on the '*Factors that Influence EFL Teachers' Attitudes Toward the Use of ICT in Classroom Practice at the Level of Secondary Education in Algeria.*' However, it is worth noting that the Algerian context generally remains under-represented by research in the implementation of ICT in Higher Education

Institutions. The few studies on the country that I was able to review can be classified according to one educational perspective in relation to Teachers' Attitudes toward the Use of Information Communication Technologies in English for Academic Purposes in Algerian Higher Education by using Technology Acceptance Model (TAM) (Bouaricha & Hamzaoui, 2021). Despite the fact that the aforementioned studies were only partially pertinent to my research, they were nonetheless beneficial to draw on when writing about the context of the study in Chapter 2, which assisted in developing a conceptual picture of the background surrounding the data and findings. Within the scope of this thesis, I argue that Algeria is a context that has the potential to create useful data for the adoption of ICT in Higher Education Institutions in the Arab world.

My interest in ICT in education and didactics has also contributed to the emergence of this thesis. This interest has developed since the time I was doing a Magister Degree in English Linguistics and Didactics. My Magister dissertation for instance explored the attitudes of EFL teachers toward ICT in Algeria at the level of Secondary Schools in the Western District of Chlef, which represented an innovation and a turning point in my educational career, and explored the implications of this innovation on teacher education and development. This interest was further expanded and refined in my doctorate programme.

I have come to the end of this four-year journey of my doctoral research, and after finishing my Magister in Educational Technology from the University of Algiers 2, I thought I had learned some of the skills for conducting scientific research in the social and human sciences. However, I was concerned about the generalisation of research results. My concern related to controlling and expending the different variables. After some years, I was encouraged by my supervisor at the University of Algiers 2 to embark my PhD research at the level of Higher Education Institutions mainly at Hassiba Benbouali University of Chlef as being a starter teacher there in 2018.

Hence, my initial research proposal for the degree of doctorate centres round the investigation of the factors associated with teachers' Behavioural Intention and actual use of ICT in EFL classrooms, which in essence represented a case study of the English Department at Hassiba Benbouali, University of Chlef, in the West of Algeria. My decision to embark on such research is also influenced by the current ongoing developments in the implementation of ICT in education and the educational reforms affecting the Higher

Education in Algeria, which I believed represented an important event in the professional lives of the teachers because it affected them directly as implementers of these reforms.

When I started the first year of this PhD programme in 2019, I faced many challenges. The first challenge related to the reviewing process of a large number of research articles and books on my selected broad topic entitled '*Factors that Influence Teachers' Acceptance and Use of ICT in EFL Classrooms*' and to new philosophical concepts such as ontology, epistemology, and research paradigm. This new experience was completely different from my first Magister degree experience in Algiers. Thus, in the first year, I found it hard to think critically because of my paucity of knowledge in conducting a sequential explanatory mixed-methods study due to its new emergence in the world of academia and the long duration of time needed for the collection and analysis of both quantitative and qualitative date sequentially as well as my home responsibilities and the unexpected circumstances of the spread of COVID-19 globally. I realised this hardship after studying the UTAUT model as my selected theoretical framework for my current research. Then, I found that this model could help me in formulating the research questions and hypotheses and the interpretation of my quantitative and qualitative data in reference to the huge amount of work published in international peer-reviewed journals by different research scholars in different countries.

Furthermore, the most interesting new experience was to adopt a pragmatic approach which is based on abduction reasoning that swings back and forth between induction and deduction for the production of useful knowledge and serves as a rationale for rigorous research. Indeed, as soon as I felt I understood this approach, I realised that this was the suitable approach I needed to adopt in research. This approach shifted my focus from the experimental view to the combination of positivism and interpretivism views. This new experience with the pragmatic approach has changed my area of interest to focus more on the existing experiences of ICT use in Algerian Institutions. I read about the factors and barriers to using ICT in the classroom and found that the literature reported the effects of socio-psychological factors on the adoption of ICT using both technology acceptance models, TAM and UTAUT. However, there was a lack of details about which psychological factors, and how to deal with these factors. I looked at these factors from another angle and I asked myself why such factors have not affected certain teachers in the same degree within different institutions and from the different countries. Hence, I thought

that there might be something missing in relation to the socio-psychological factors in the Algerian Higher Education and outside.

During the first year of my PhD journey, I aimed to improve my skills and my knowledge about educational research in general and about my area in particular. I attended many training courses concerning the software for the analysis of the quantitative data such as IBM SPSS V26.0 and the analysis of the qualitative data mainly MAXQDA 2020 and presented at local and international conferences. Last and not the least, at the time of writing of this thesis in the last week of November 2021,the ongoing unusual circumstances with the spread of COVID-19 roused my eagerness and willingness to conduct a recent empirical research on the experiences of EFL teachers with the sudden switch to Emergency Remote Teaching (ERT) of English during the time of COVID-19 Pandemic at the Department of English at Hassiba Benbouali University of Chlef (Makhlouf & Bensafi, 2022).With the recommendation from my supervisor, Prof. Bensafi, and from many scholar-researchers and colleagues, I found this topic very interesting and of paramount importance in the field of Higher Education due to its originality in Algeria as it can add an important contribution to our understanding of the use of ICT in Higher Education Institutions.

The different experiences and skills I earned during this PhD journey positively shaped my academic profession and as well as my personal development. My responsibility after the completion of this research journey, is to develop these new experiences to the further horizon in the world in general and in Algeria in particular. As the Chinese proverb goes '*A journey of a thousand miles begins with a single step'*. Likewise, I consider this thesis as the stepping stone of my academic research as I am hoping to pursue research in ICT and link research with practical action by training teachers and help them acquire new skills and experiences. Thus, research is a journey. We have to travel it well!

I end this thesis by stating that socio-psychological factors play a significant influence on Higher Education EFL teachers' acceptance and practical usage of ICT in their teaching practices. If the teacher has the motivation to use ICT pedagogically, if the curriculum is designed to integrate ICT, if the stakeholders find a way to fulfil teachers' personal concerns and motivations with policy goals for the effective implementation of ICT, or if university leaders support teachers to use ICT in teaching practices, then this usage will be

successful. Acceptance and use of ICT for educational purposes may be possible once these conditions are met.

The current study has demonstrated that the key drivers of teachers' acceptance and use of ICT may be explored from a variety of angles. As a novice researcher, I may have missed some elements, but I believe this is all part of my learning process for conducting more research studies in the future. I continue to use the criticism I have received to develop my research abilities and broaden my knowledge in the area of teachers' ICT use. Hence, I believe that the big picture is still incomplete since educational research is a continuous process in which one work ends and another begins.

Conclusion

Based on the research questions and hypotheses of the current study, this chapter has discussed the main psychological and socio-demographic factors that emerged from the integration of quantitative and qualitative data in relation to the literature.

The results of this mixed methods research have shown that from seven constructs of the model, there were three constructs which did not play any direct role in the acceptance and use of ICT. Performance Expectancy, Effort Expectancy and Social Influence did not influence Behaviour Intention. However, from the general findings from both phases of the study it is apparent that the most influential factor influencing intention to use ICT was teachers' *Attitude towards Using Technology* , the newly added construct to the original UTAUT Model. Findings from both questionnaire and interview data unravelled that Facilitating Conditions and Behavioural Intentions were determined to be salient factors that positively influenced the actual usage of ICT by the EFL teachers. The benefits of incorporating ICTs into teaching was generally appreciated by the informants and attitudes were positive, although teachers felt that more could be done by the Ministry of Higher Education in terms of providing appropriate training opportunities and promoting awareness of a clear policy on the successful implementation of ICT in teaching practices. If this were achieved, teachers would feel that it was easier to incorporate Information Technologies into their classroom practice and feel less anxious about doing so.

The key findings from the study demonstrated that important concepts in the modified UTAUT model – the perceived importance of Facilitating Conditions, Performance Expectancy, Effort Expectancy, and Teachers' Attitude toward Using Technology – all predicted directly or indirectly to teachers' Behavioural Intention and Actual Use of ICT in EFL classrooms, confirming this study's hypotheses and the value of the revised UTAUT model. This study thus contributed to a conceptual understanding of efficient use of Information Technologies as a basis for developing an ICT acceptance model that can help Higher Education Institutions achieve a high level of use and usability of ICTs among teachers in their classrooms. Hence, the suggested theoretical framework based on the revised UTAUT model may work as a future guide for researchers to improve teachers' acceptance and use of ICT. The discussion of the findings offers a basis for policy-makers to formally integrate Information Technology use into classroom teaching practices.

GENERAL CONCLUSION

General Conclusion

The current study was conducted in Algeria where there has been a growing interest in the investment for better use of ICT in the field of Higher Education. To date, there has been no government evaluation report carried out to assess the outcomes of these investments with respect to the use of ICT in Algerian Higher Education Institutions. The overall goal of the educational reforms in many countries is to develop an effective ICT-based teaching and learning environment. In order to achieve this goal, the current study asserted that investigating the factors influencing teachers' acceptance and use of ICT into classroom teaching practices could be useful in several ways. Most importantly, investigating the key socio-psychological determinants that may influence teachers' acceptance and use of ICT was useful in identifying the barriers to effective usage of ICT in education and to determine what interventions will be required.

The purpose of this explanatory sequential mixed methods study was to better understand the factors that influence University teachers' acceptance and use of ICT in EFL classroom teaching practices by combining both quantitative and qualitative data respectively over the course of two Academic Years (2020-2021 and 2021-2022). In the current study, the actual use of ICT was explored using quantitative online questionnaires and qualitative semi-structured interviews with Algerian Higher Education in-service EFL teachers from the Department of English at Hassiba Benbouali University of Chlef. More precisely, the objectives of this study were:

- To investigate the factors that influence EFL teachers' behavioural intention and actual use of ICT in the Algerian Higher Education through the extended Unified Theory of Acceptance and Use of Technology
- To identify the effect of socio-demographic characteristics of teachers on actual use of ICT.
- To develop a theoretical framework for ICT acceptance in the context of Higher Education Institutions (HEIs) in Algeria.

As addressed in the previous section, the first step in investigating Higher Education teachers' acceptance and use of Information and Communication Technologies is to identify the factors influencing their intentions to use, as well as the actual usage of Information Technologies. Hence, the focus of the current study is to understand the extent

of influence exerted by psychological and socio-demographic variables on actual use of ICT by University EFL teachers in Algeria. The study uses the extended model of the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical framework to examine the psychological and socio-demographic factors that influence the actual use of ICTs among Higher Education teachers. The UTAUT model provides a suitable underpinning for this objective. Aiming to bridge the research gaps regarding the key determinants of teachers' acceptance and use of ICT and remedy the research limitations concerning UTAUT model, this study fully adopted the UTAUT model with the inclusion of '*Attitude toward Using Technology*' and introduced three moderators (gender, age, and teaching experience) to suit to the Algerian education setting. Moreover, teachers with different demographics from the same Higher Education Institution were involved as research informants in this study. Thus, the proposed UTAUT incorporated five constructs: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology. Individual differences – such as age, gender, and teaching experience – were hypothesised to moderate the effects of these constructs on behavioural intention and use behaviour of ICT.

The research study has used t-test and ANOVA to investigate the mean difference, applied correlation analysis to establish the relationship and regression analysis to examine the proportion of variance explained by the independent and moderator variables with respect to the informants' actual use of ICT as dependent variable.

The current study assumes significance in addressing the in-service EFL teachers' acceptance and use of ICT pedagogically in classroom environment. Such an understanding will help in identifying key determinants of use of ICT in institutions and will provide guidelines to institution administrators for successful use of ICT in teaching and learning process. Therefore, the current study was carried out to address the following research questions:

1) What are factors that influence EFL teachers' acceptance and use of Information and Communication Technology (ICT) in their teaching practices in the Algerian Higher Education Institutions?

2) How do demographics moderate teachers' perceptions of these factors?

3) How can the revised Unified Theory of Acceptance and Use of Technology (UTAUT) model, as the theoretical framework of the current study, be used to better understand what Algerian Higher Education teachers perceive they need to effectively use ICT?

Accordingly, responding to the research questions, seven hypotheses were postulated based on the extended UTAUT model. The suggested research model hypothesised that Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude toward Using Technology will predict Behavioural Intentions to use ICT in teaching EFL and Use Behaviour. It was also hypothesised that Age, Gender, and Teaching Experience will moderate the impact of the five factors included in the revised research model.

The adopted mixed-methods research methodology of the current study was based on the combination of a qualitative method to answer the research questions and an online questionnaire survey to test the hypotheses in two successive stages. The first stage consisted of a questionnaire in which both descriptive and inferential statistics were used to analyse the quantitative data. The second stage consisted of semi-structured interviews which were analysed by using thematic analysis technique. A total of thirty-three University EFL teachers (22 females, 11 males) took part in this study, from which 6 interviews were drawn on the basis of purposeful sampling. Of the 45 questionnaires submitted online to participating informants, 33 were successfully completed and collected representing a valid response rate of 73.3%.

Findings from this study revealed that Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Attitude Twords Using Technology and Behavioural Intention are positively correlated with the actual use ICT for teaching purposes among EFL teachers from the Department of English at Hassiba Benbouali University of Chlef. The current study identified that teachers' acceptance and use of Information Technologies in teaching practices were influenced by a number of exogenous and endogenous factors. The exogenous factors included (Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SE), Facilitating Conditions (FC), while the endogenous factors consisted of Attitude toward Using Technology (ATUT), Behavioural Intention (BI), and User Behaviour (UB).

This study has demonstrated that factors such as *Attitude Toward Using Technology* and Facilitation Conditions are positive and significant predictors of the intention of university teachers to adopt ICT. A unique finding from this study was that *Attitude Toward Using Technology* was identified as the most powerful predictor of teachers' behavioural intention of using Information Technologies. This finding contributes to the UTAUT scholarship in the Higher Education context, as in a formal teaching and learning environment, as it shows that ICT can facilitate teachers to deliver entertaining and enjoyable courses. Our findings showed that attitude partially mediates the effects of Performance Expectancy, Effort Expectancy, Facilitating Conditions, and Social Influence on Behavioural Intention, and also has a non-direct influence on Usage Behaviour. The positive attitudes that EFL teachers possessed with regards to Information Technologies suggested that teachers grasped the significance of implementing ICTs in Higher Education. The findings concerning teachers' positive attitudes were consistent with previous research studies, mainly (Makhlouf, Bensafi 2021; Hoi 2020; García Botero, Questier, Cincinnato, He, Zhu 2018) who found that teachers who took part in their studies had favourable attitudes towards the adoption of technology in teaching and learning processes.

The technology attributes (i.e., *Performance Expectancy and Effort Expectancy*) were found to be significant predictors of attitude. This implies that the teachers attribute considerable importance to the extent to which the technology in question may be useful and easy to use. Therefore, stakeholders should concentrate on enhancing the ease of use and usefulness of technologies such that acceptance and use of ICTs may be used more successfully by teachers in their classroom teaching practices.

Another major finding in this study was that Facilitating Conditions and Behavioural Intentions were determined to be salient factors that positively influence the actual usage of ICT by the EFL teachers. As such policy-makers and administrators at the level of all Higher Education Institutions need to ensure that the right resources and support are available to teachers in order to motivate them and enable them for using ICT in EFL classroom teaching practices. The results from the data obtained partially support the UTAUT's ability to explain the factors responsible for the acceptance of educational technology in developing countries, in Algeria to be specific. Furthermore the study contributes to the formulation of approaches and guidelines to enhance the adoption of

educational technologies in developing countries in general and in the Arab world in particular. A common denominator among the quantitative and qualitative data was the optimism and eagerness of the EFL teachers for the need of training opportunities for teaching English through the use of ICT.

The quantitative and qualitative findings found that contextual factors (i.e., Facilitating Conditions) had direct effect on actual use of Information Technology. This suggests that teachers may associate importance to the Facilitating Conditions such as technical support and training programs as well as to the experiences of other teachers in using the technology. The significant results of Facilitating Conditions reflect that the existence of technical support and supportive infrastructure is of prime importance to help and support teachers to use ICT in their teaching practices. Hence, Higher Education Institutions should consider providing adequate infrastructural facilities and proper training to users so that they can be positively inclined to use new technologies pedagogically. Therefore, making sure that teachers have received adequate training and gained the required skills to use Information Technologies effortlessly to facilitate teaching and learning process is a crucial prerequisite for the implementation of ICT across Higher Education Institutions. Surprisingly, Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions do not impact the EFL teachers' intention to use ICT.

On the whole, the findings of this study revealed that four of the model's seven constructs had no impact on the acceptance of ICT. Performance Expectancy, Effort Expectancy, Social Influence, and the Facilitating Conditions had no direct influence on behaviour intention. This conclusion contradicted Venkatesh et al.,'s (2003) assertion and earlier research on the same theme. Only teaching experience, out of three moderators, mitigated the effect of Facilitating Conditions and Beahavioural Intention. It is important to state that, in this study, the use of ICT was voluntary and that could have resulted in SI having any statistical effect on BI.

In accordance with the moderated interaction effects in the revised UTAUT model, this study found that gender, age and teaching experience were moderating variables of the relationship between some of the six psychological constructs and teachers' behavioural intention and the actual use behaviour of ICT. Gender and age positively moderated the effects of PE and BI. Experience positively impacted on the relationship between FC, ATUT and BI.However,some factors, for example Performance Expectancy, did not

directly influence teachers' intentions or use of Information Technologies, but when interacting with moderators (age, gender, and teaching experience) were found to be significant. Hence, the fifth,sixth and seventh hypotheses, assuming the moderated effects of gender, age and teaching experience on the relationship among constructs, were partially accepted. Specifically, gender, age, and teaching experience displayed specific moderating effects on the relationship between Performance Expectancy, Facilitating Conditions, Attitude toward Using Technology and Behavioural Intention. These demographic differences appear to confirm the crucial role they play in teachers' accaptance of ICT in teaching practices. This study, therefore, raises awareness of the big impact of moderators on ICT usage in regard to variations in gender, age, and years of teaching experience. Understanding these variations will assist in the creation of superior strategies, programmes and policies that can help teachers engage more and enhance the experience of teaching through the accaptance and use of ICT.

In comparing the findings of the current study to the original UTAUT where the explained variance was 70%, it appears that the proposed model of UTAUT explains 38.7% of the factors that influence actual use of ICT by Attitude toward Using Technology, Behavioral Intention, and Facilitating Conditions; Behavioral Intention is explained 50% by *Attitude*; and Attitude toward Using Technology is explained 47% by Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. In light of this, this study unexpectedly found that Behavioural Intention was influenced only by *attitude*. The disparity in explained variance shows that there may be other factors that influence ICT behavioural intention to use that deserve further investigation. Such factors may involve technical support, culture and education policy.

Overall, the findings of this research are in line with many other theoretical and empirical research studies on the influence of socio-psychological factors on the acceptance and use of technology in numerous countries and cultures through the expansion of the UTAUT Model (Altalhi 2020; García Botero, Questier, Cincinnato, He, Zhu 2018; Ekayanti, Irwansyah 2018; Yakubu, Dasuki 2019; Khan, Qudrat-ullah 2021; Dwivedi, Rana, Jeyaraj, Clement, Williams 2019). These findings are crucial since they underscore the importance of explicitly modelling demographic characteristics of individuals in theories and models of ICT acceptance and use (Hu, Laxman, Lee 2020; Šumak, Šorgo 2016).

The theoretical framework based on the original UTAUT model and revised for the Algerian Higher Education context demonstrated that a lack of clarity and proper implementation of education policies regarding ICT, and anxieties about not having sufficient skills or technical support to make use of ICTs were negatively influencing teachers' intentions to accept and use ICT in their teaching practices. Furthermore, that inadequate tools, technical support and resources along with not having adequate educational experience and training in the use of ICTs were the main impediments to their actual use in EFL classrooms in the Algerian Higher Education Institutions. Thus, the findings of the current study confirm that the extended model of UTAUT is effective mainly with the inclusion of 'Attitude' in explaining the determinants of acceptance and use of ICT in classroom teaching practices by the EFL teachers in the Algerian Higher Education Institutions. Hence, to develop favourable attitude and reduce hesitancy and anxiety among teachers in the use of ICTs, educational technology experts should arrange workshops for teachers to share their experiences.

Most importantly, investigating the determinants of teachers' acceptance and use of ICT was useful in identifying the barriers to effective usage of ICT in education and to determine what interventions will be required. Integrated findings from the quantitative and qualitative data revealed that inadequate tools, technical support and resources along with not having adequate educational experience and training were the top hindrances that influenced teachers' actual use of ICT in EFL classrooms in the Algerian Higher Education Institutions. This was linked to a number of barriers. Teachers' limited knowledge of ICT skills was found to have the greatest impact on their low level of ICT implementation. The absence of stable internet connection could be responsible for most of the barriers related to ICT implementation. Therefore, the mixed quantitative and qualitative findings in the interpretation stage of the current study provided answers to the research questions and filled a gap in the literature by the identification of the key determinants of teachers' acceptance and actual use of ICT in the Algerian EFL classrooms.

Finally, this research study has contributed to the understanding of ICT usage in Higher Education from the perspectives of teachers. However, in order to enhance and maintain the quality of ICT use in Higher Education, it is imperative that further investigation on the key recipients of ICT in education, namely the students, is given due focus. The major goal of ICT in education is to improve the learning process and ensure that students receive

the highest quality education. As a result, more research into the use of ICT in education from the perspective of students is highly needed. Some of the features of ICT in education that needs to be investigated involve student acceptance of ICT, their attitudes towards ICT, anxiety around ICT usage, barriers to ICT integration, their level of ICT usage, perceived and actual use of ICT in learning, and the impact of ICT usage on student motivation. This will help to develop a holistic understanding of ICT acceptance and use in education from the perspectives of various stakeholders in Higher Education Institutions.

It is hoped that the findings of this study shall help to improve our understanding about the key determinants of ICT acceptance and use in the Algerian Higher Education Institutions, thereby providing us an opportunity to refine the Technology Acceptance Model of UTAUT to suit this country's unique cultural context and offering a guiding light that maps a new path to investigate the factors that enable or hinder technology adoption in other developing countries in general and in the Arab world in particular.

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APPENDICES

Appendices

Appendix A
Sample Cover Letter for Questionnaire

Postgraduate Suite

Information Systems Research Centre

Information Systems Institute

University of Algiers 2

 Salford M5 4WT

Dear Sir/Madam

Dear Teacher

My name is Kouider Makhlouf and I am interested in your attitudes and experiences of using Information Technologies in your teaching.

Educational technologies are electronic tools such as computers, Smart Boards and Tablets; which allow the use of teaching techniques such as Power Point presentations, using Internet resources and so on.

This questionnaire has been developed to enable me to collect data for my research for my Doctoral Degree from the University of Algiers 2. The research is designed to find out the factors that might influence the acceptance and use of ICT in the Algerian Universities . Your opinions about these issues are vital for this study.

Please note that your participation in this study is confidential. Nobody other than the researcher will look at, or use, your answers to the questionnaire. Your data will be kept securely by the researcher and all the information will destroyed after the thesis is finished, and no names will be mentioned in the study. I would also like to draw it to your attention that your participation in this survey is voluntary and you are free to withdraw at any point. Thanking you in anticipation of your kind cooperation and positive participation in this study.

Yours faithfully,

Kouider MAKHLOUF

Mobile: 0699991798

Email:makhlouf .kouider38@gmail.com

kouider.makhlouf@univ-alger2.dz

Appendix B

Survey Questionnaire for EFL Teachers on ICT Usage

Important: When completing the questionnaire, please keep in mind that we are using ICT in the context of teaching and learning, by University EFL Teachers. ICT here refers to the application of digital equipments to all aspects of teaching and learning, which encompasses (PC, TV, Radio, Cellular phones, Laptops, overhead projectors, slide projectors, power-point projector, electronic boards, internet, hardware, software, and any technology specific to your teaching area). Please rate each item of the following constructs on 1-5 Likert scale. Where (1) is "**Strongly Disagree**," (2) is "**Disagree**", (3) is" **Neutral**", (4) is "**Agree**", and (5) is "**Strongly Agree**".

Section 1: Demographic Information

1. **Please indicate your gender**

   ☐　　Male
   ☐　　Female

2. **Your age group :**

   ☐ 18-25 years
   ☐ 26-35 years
   ☐ 36-45 years
   ☐ 46-55 years
   ☐ 56-65 years
   ☐ 65 years or more

3. **Teaching Experience:**

   ☐ Less than 1 year
   ☐ 1-5 Years
   ☐ 6-10 Years
   ☐ 11-15 Years
   ☐ 16-20 Years
   ☐ 21-25 Years
   ☐ 26 Years and over

4. **Is ICT system use mandatory or voluntary at your Institution ?**

   ☐　　Mandatory
   ☐　　Voluntary

5. **Technology equipment available at your University :**

   ☐ Classroom Computers
   ☐ Smartboard
   ☐ Wall Mounted Projector
   ☐ Computer Lab
   ☐ Overhead Projector
   ☐ Internet Access in Classroom
   ☐ Laptop
   ☐ None of the above
   Other: ………………………………………….

6. **Tools used while teaching :**

   ☐ Computer
   ☐ Projector
   ☐ Computer Lab
   ☐ Tablet
   ☐ Mobile
   ☐ Laptop
   ☐ None of the above
   Other: ………………………………………….

7. **How often do you use ICT?**

   ☐ Never
   ☐ Once a month
   ☐ Once every week
   ☐ 2–4 times a week
   ☐ Everyday

8. **Factors that hinder you most for using ICT while teaching**

   ☐ Lack of ICT knowledge
   ☐ Lack of time
   ☐ Complexity of integrating ICT
   ☐ Limitation of infrastructure
   ☐ Lack of training
   ☐ Lack of access
   ☐ Lack of technical support
   ☐ Lack of professional development opportunities on using ICT in teaching

Section 2

1) *Performance Expectancy*

	How far do Information Technologies are currently helping you in your job by filling in (●) the appropriate number. Make sure to respond to every item.	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	**2**	**3**	**4**	**5**
1.	I find technology useful for teaching and learning.	O	O	O	O	O
2.	Using ICT enables me to accomplish tasks more quickly.	O	O	O	O	O
3.	Using technology improves my performance.	O	O	O	O	O
4.	Using technology increases my productivity.	O	O	O	O	O

2)*Effort Expectancy*

	Please indicate your reaction to each of the following statements by filling in (●) the appropriate number *that represents your **level of agreement and disagreement**. Make sure to respond to every statement.*	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	**2**	**3**	**4**	**5**
1.	Learning to use ICT is easy for me.	O	O	O	O	O
2.	I find ICT easy to use.	O	O	O	O	O
3.	I find using ICT in teaching enables more flexible interaction.	O	O	O	O	O
4.	It is easy for me to become skillful at using ICT.	O	O	O	O	O

3)Social Influence

These statements seek to determine what you currently think other people's ideas are about your use of Information Technologies. Make sure to respond to every item.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	My colleagues who influence my behaviour think that I should use technology more innovatively.	◯	◯	◯	◯	◯
2.	Colleagues, who are important to me, think that I should use technology.	◯	◯	◯	◯	◯
3.	People whose opinions I value prefer that I use ICT.	◯	◯	◯	◯	◯
4.	My colleagues have helped me to use ICT.	◯	◯	◯	◯	◯
5.	My students think I should use ICTs.	◯	◯	◯	◯	◯

4)Facilitating Conditions

Please indicate your reaction to each of the following statements by filling in (●) the appropriate number *that represents your **level of agreement and disagreement***. Make sure to respond to every statement.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	Classrooms at my University are well equipped with ICTs.	◯	◯	◯	◯	◯
2.	I have the resources necessary to use ICT (e.g. Laptop,PC, Internet etc.).	◯	◯	◯	◯	◯
3.	I have the knowledge necessary to use ICTs.	◯	◯	◯	◯	◯
4.	The ICT is not compatible with other computer systems I use.	◯	◯	◯	◯	◯
5.	When I encounter difficulties in using ICT in classroom, I know where to seek assistance.	◯	◯	◯	◯	◯
6.	Training and manuals for ICTs are available.	◯	◯	◯	◯	◯

5)*Attitude Toward Using Technology*

The following items relate to *your attitude toward the use of ICT*. Please indicate your **level of agreement or disagreement** by filling in (●) the appropriate number. *Make sure to respond to every statement.*

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	The use of ICT at our University is a good idea.	○	○	○	○	○
2.	ICT makes teaching more interesting.	○	○	○	○	○
3.	Working with ICT is fun.	○	○	○	○	○
4.	I enjoy using ICT in teaching.	○	○	○	○	○
5.	ICT makes learning more interesting for the students.	○	○	○	○	○
6.	Above all, I have positive feelings towards the use of ICT in teaching.	○	○	○	○	○

6)*Behavioural Intentions to use ICT*

The following items relate to **your intention to use ICT**. *Please indicate your* **level of agreement or disagreement** *by filling in (●) the appropriate response.*

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1.	I intend to continue to use ICT in the future.	○	○	○	○	○
2.	I expect that I would use technology in the future.	○	○	○	○	○
3.	I plan to use technology in the future.	○	○	○	○	○
3.	I am willing to encourage other people to use ICT.	○	○	○	○	○

7)*Actual Use of Information Technologies*

The following items relate to *your actual use of ICT*. Please indicate your **level of agreement or disagreement** by filling in (●) the appropriate number. *Make sure to respond to every statement.*	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	1	2	3	4	5
1. I use computers for my class preparation.	◯	◯	◯	◯	◯
2. I use computer during my classroom instruction (teaching).	◯	◯	◯	◯	◯
3. I use other device (e.g., mobile, tablet PC) for my class preparation	◯	◯	◯	◯	◯
4. I use other device (e.g., mobile, tablet PC) during my classroom instruction.	◯	◯	◯	◯	◯

Other comments: Please add any comments that would encourage your use of Information and Communication Technologies (ICTs) in the classroom; and/or anything you feel discourages you from using technologies:

....

....

   o **I am willing to participate in an interview for this research.**

   ☐ Yes
   ☐ No
   ☐ Maybe
   In case you agree for taking part in a short follow-up interview. I would appreciate it if you could leave contact details below.

   Contact person's name: ....

   Contact telephone number (if applicable) :...

   Email address: ....

   Thank you for your time and patience in completing this questionnaire, it has been much appreciated. A summary of results will be emailed to all informants once the data is analysed.

Thank you for Completing the Questionnaire

Appendix C

Sample follow-up Email for Questionnaire (Reminder)

University Abou El Kacem Saâdallah, Algiers 2

Faculty Of Foreign Languages

Department Of English

Dear Sir/Madam

We are conducting a survey about the factors that influence your acceptance and use of Information and Communication Technology (ICT) in Classroom Teaching Practices. The main purpose of the study is to explore the factors influencing teachers' actual use of ICT within the EFL classrooms in the Department of English at the level of Hassiba Benbouali University of Chlef as well as the issues hindering its use.

We emailed you one of our questionnaires recently and asked if you could please complete it online. Unfortunately, we do not appear to have received a reply from you.

We have enclosed a second copy of the questionnaire, which will take you just a few minutes to complete. We appreciate the significant pressure that you currently work under but it would be extremely helpful to our research, if you would be kind enough to take the time to complete this new questionnaire as soon as possible. The information you provide will contribute to an important part of our research which will help us to understand the factors that influence your use of ICT in teaching practices.

We promise that the information that you will provide will remain absolutely confidential. Your name will not be revealed or associated with your response nor will anyone be allowed to see your response.

We appreciate your willingness to help us in our research effort. If you would like a copy of the summary of the results please indicate this on the last page of the questionnaire. Thank you for your time and patience in completing this questionnaire, it has been much appreciated.

Yours Sincerely,

 Kouider MAKHLOUF

Research Student

Telephone: 0699991798

 Email: kouider.makhlouf@univ-alger2.dz or makhlouf .kouider38@gmail.com

Appendix D

Sample Request Email for Interview

Re: The Factors Influencing Teachers' Acceptance and Use of Information and Communication Technology (ICT) in EFL Classrooms

University Abou El Kacem Saâdallah, Algiers 2

Faculty Of Foreign Languages

Department Of English

Dear Colleague,

Thank you very much for agreement to participate in the follow-up interview. As part of my research project currently underway to understand the determinants of using Educational Technologies. To this end, I would like to carry out a short interview with you in order to help us better understand the factors that influence your acceptance and use of Educational Technologies in teaching practices at the level of Hassiba Benbouali, University of Chlef.

It is much appreciated if you are willing to give half an hour of your time to discuss these issues with me. You will find attached a list of possible dates for these interviews to take place. I would be very grateful if you could indicate when you will be available (with a number of alternatives if at all possible) and return this to me as soon as it is convenient for you to do so, using the email below.

Thank you in advance for your help in this matter and I look forward to meeting you in the near future.

Yours Sincerely,

 Kouider MAKHLOUF

Research Student

Telephone: 0699991798

Email: kouider.makhlouf@univ-alger2.dz or makhlouf .kouider38@gmail.com

Appendix E

Semi-Structured Interview Protocol

Interview Questions (Embedded Questions)

I would like to take this opportunity to thank you for agreeing to be interviewed today. I would like to remind you again that at no stage during the interview will you be required to identify yourself. The answers you provide will be treated confidentially.

Questions for Interview

1. **Performance Expectancy**

   • How useful are Information Technologies in teaching and learning?

………………………………………………………………………………………………
………………………………………………………………………………

   • Are Information Technologies a positive tool in teaching?

………………………………………………………………………………………………
………………………………………………………………………………

   [*Do you think ICT is an effective teaching method? Why? Why not?*]

………………………………………………………………………………………………
………………………………………………………………………………

2. **Effort Expectancy**

   • How easy or difficult is it for you to use technology in your teaching?

………………………………………………………………………………………………
………………………………………………………………………………

3. **Facilitating Conditions**

   • Do you have Internet connection in your classrooms? *[How does this affect your teaching?]*

………………………………………………………………………………………………
………………………………………………………………………………

   • Do you take into account whether your students have access to technology when preparing your lessons?

………………………………………………………………………………………………
………………………………………………………………………………

   • What technological equipment is available at your **University**? Which do you use?

……………………………………………………………………………………………

   [*What ICT resources are available at the University?*]

[Do all teachers have access to these resources?]

…………………………………………….……………………………………

• Do you have any digital resources at University?

………………………………………………………………………………………

………………………………………………………………………………

• Do you have a support team at University to help with technologies?

………………………………………………………………………………………

………………………………………………………………………………

*[What technical support is available at the University? – is this internal support
or external support?]*
*[Does this University have a designated ICT Technician at the level of the Faculty of
Foreign Languages ? • If not, why not ?]*
*[Does this University of Chlef have a designated ICT Technician at the level of the Faculty
of Foreign Languages ? • If not, why not?]*

4. **Social Influence**

• Can you tell me what you think other people's attitudes are about while you are using
technologies in teaching?

………………………………………………………………………………………

………………………………………………………………………………

[Do you think that teachers of English are encouraged to use ICT in their teaching?]
What about you [Would you encourage all teachers to use ICT in their teaching?]
*[Has your administrator at the level of Faculty or University explained any plans or
policies on Information Technologies to you?]*

5. **Behavioural Intention to Use Technology**

• Do you intend to use Information Technologies in the future?

………………………………………………………………………………………

………………………………………………………………………………

• Do you intend to attend a training programme on how to use Information Technologies in
the future? Online or Offline as far as the Covid-19 is concerned?

………………………………………………………………………………………

………………………………………………………………………………

• What do you expect from web-based training programmes?

………………………………………………………………………………………

………………………………………………………………………………

• Would you encourage all teachers to use ICT in their teaching?

6. **Use Behaviour**

• What digital equipment do you use in your teaching? How many times do you use it in
teaching?

………………………………………………………………………………………

………………………………………………………………………………

7. Attitude

• Do you prefer to use Information Technologies? Please explain?

…………………………………………………………………………………………………

……………………………………………………………………………………

[Do you feel ICT has altered your job as an EFL Teacher? • If yes, how?]

[Do you feel that EFL teachers see ICT as an important component in their teaching practices?

8. Education Policy (Training and Professional Development)

• Have you attended any training sessions in using Information Technology? Can you tell me more about these sessions? *[either formally or informally?]*

…………………………………………………………………………………………...……

……………………………………………………………………………………

• If you did not attend any training, why was this?

…………………………………………………………………………………………………

……………………………………………………………………………………

• Did anyone encourage you to attend a training course about using Information Technologies?

…………………………………………………………………………………………………

……………………………………………………………………………………

• Would you encourage teachers at University to engage in Professional Development courses in ICT?

…………………………………………………………………………………………………

………………………………………………………………………………....

9. Barriers to the Use of Information Technologies

Remind teachers about all the factors regarding technology acceptance in the revised UTAUT

• In your experience, what do you think are the barriers to the use of Information Technologies in the teaching and learning process?

Before we conclude this interview, would like to add any additional information relating to any of the issues contained in the questions?

Thank you very much

Thank you for taking the time to be interviewed today.

Appendix F

Themes, Sub-Themes and Codes from the Qualitative Analysis

Themes	Sub-Themes	Codes
Performance Expectancy	Application Use	Ask them to watch a video via wall-mounted datashow.
		I oftentimes use loudspeaker to encourage students to participate
		I use videos or audios to attract the interest of the learners
	Usefulness	Beneficial technological tools
		ICTs enhance teachers and learners' performance.
		Facilitator of the process.
	Productivity	Improvement of teachers performance
		More engagement of learners
Effort Expectancy	Ease of use	Very Easy
		Less time consuming than traditional teaching ways
	Flexibility and Accessibility	Flexible
		Accessible
		Portability
	Time Management	Saving Time
		Saving Effort
Social Influence	Encouragement	My colleagues encouraged me to use ICT in my class.
		I think Departmant wants us to use IT but it does't care if we don't use it in practice
		Comfortablility
	Support	There are some resources but they are insufficient.
		Lack of support from the university.

		Lack of Motivation from the university.
Facilitating Conditions	Internet Connection	Absence of Internet in shadow areas
		The total absence of WIFI Internet connection in classrooms
		Difficulty of not having quick network in our mobiles
	Training and Knowledge	No training opportunities
		I did a training course on the use of ICT from the technical side
		Training sessions are always theoretical and far away from the realities of the classroom (pedagogical side).
		I'm eager to attend training sessions
	The number of students	ICT facilitates the course, especially that students are numerous
Attitude Toward Using Technology	Enjoyment	Working with ICT is easy and fun
		The use of ICT is a good idea.
		I am interested and excited for using ICT
		I'm always enthused
	Motivation	I am self-motivated to use technology in my class.
		I'm the one among the advocates of ICT usage
		I'm intrinsically motivated.
Behavioural Intention	**Intention or Readiness**	The intention starts from now
		I am ready for the use of technology
	Willingness	I would encourage teachers.

مــــخـــــص

الاستقصاء في العوامل المؤثرة في قبول الأساتذة لتكنولوجيا الإعلام والاتصال واستخدامها في أقسام اللغة الإنجليزية كلغة أجنبية: دراسة حالة لقسم اللغة الإنجليزية في جامعة حسيبة بن بوعلي الشلف

تلعب تكنولوجيا الإعلام والاتصال دورًا مهمًا في المؤسسات الحديثة من خلال تسهيل وتحسين عملية التدريس والتعلم لتتماشى مع المجتمع الرقمي للقرن الحادي والعشرين. وتم توفيرها من قبل سلطات التعليم العالي لضمان استخدام الأساتذة لها لتعزيز ممارساتهم التعليمية. ولسوء الحظ قبول واستخدام تكنولوجيا الإعلام والاتصال كدعم لتدريس اللغة الإنجليزية كلغة أجنبية غير مستغل بشكل كاف ، وخاصة من قبل الأساتذة في مؤسسات التعليم العالي الجزائرية. سعت هذه الدراسة إلى سد هذه الفجوة البحثية من خلال تطبيق النسخة المعدلة من النظرية الموحدة لقبول واستخدام التكنولوجيا (UTAUT) مع تضمين "الموقف" كمتغير داخلي وتجربة التدريس كمتغير وسيط.

الغرض الرئيسي من هذه الدراسة هو التحقيق في العوامل البارزة المتعلقة بقبول الأساتذة واستخدامهم لتكنولوجيا الإعلام والاتصال في ممارسات التدريس في الأقسام الدراسية للغة الإنجليزية كلغة أجنبية من قسم اللغة الإنجليزية في جامعة حسيبة بن بوعلي في الشلف. اتبعت هذه الدراسة نهجًا توضيحيًا متسلسلًا مختلطًا، مع المعطيات التي تم جمعها من خلال استبيان عبر الإنترنت مع 33استاذا وأجريت مقابلات لاحقة شبه منظمة مع ستة مستجوبين التي ركزت على المجالات التي أبرزتها نتائج الاستبيان. تم تحليل البيانات الكمية باستخدام (V.26) IBM SPSS، والتي تضمنت كلا من الإحصاء الوصفي و الاستنتاجي ، بينما تم تحليل البيانات النوعية التي تم جمعها من المقابلات شبه المنظمة عبر التحليل الموضوعي عن طريق استخدام برنامج MAXQDA .

كشفت النتائج أن نموذج البحث المقترح لـ UTAUT ملائم بشكل جيد بوجود متغيرين - الأداء المتوقع (الفائدة المتصورة) وتوقع الجهد (سهولة الاستخدام) – اللذان أثر بشكل كبير على مواقف الأساتذة الجزائريين تجاه استخدام التكنولوجيا. في ضوء ذلك، من المهم للمسؤولين والأساتذة التأكد من أن تكنولوجيا الإعلام والاتصال سهلة الاستخدام. ووجدت الدراسة بشكل غير متوقع أن النية السلوكية تتأثر فقط بالموقف. وبينت هذه الدراسة عوامل أخرى غير مؤثرة (توقع الأداء، وتوقع الجهد، والتأثير الاجتماعي، والظروف الميسرة) على نوايا الأساتذة السلوكية. إحدى النتائج المدهشة لهذه الدراسة هي أن النموذج المعدل الناتج لـ UTAUT وجد أن النية السلوكية والظروف الميسرة كانت أقوى العوامل المحددة للاستخدام الفعلي للأساتذة لتكنولوجيا الإعلام والاتصال. كما أوضحت الدراسة الدور الذي تلعبه المتغيرات الديموغرافية. توسط الجنس العلاقة بين توقع الأداء والنوايا السلوكية لاستخدام تكنولوجيا الإعلام والاتصال، حيث كان التأثير أكبر بين الذكور من الإناث توسط العمر أيضًا العلاقة بين توقع الأداء وسلوك الاستخدام لتقنيات المعلومات، حيث زاد التأثير مع تقدم العمر. علاوة على ذلك، أدارت الخبرة التدريسية للأساتذة العلاقة بين العاملين النفسيين لتسهيل الظروف والموقف تجاه استخدام التكنولوجيا مع النية السلوكية لاستخدام تكنولوجيا المعلومات، مع زيادة التأثير مع انخفاض الخبرة التدريسية. بشكل عام، تدعم النتائج قابلية تطبيق وصحة UTAUT كقاعدة نظرية للتنبؤ بالنوايا السلوكية للأساتذة واستخدام تكنولوجيا الإعلام والاتصال في ممارسات التدريس في الأقسام الدراسية للغة الإنجليزية كلغة أجنبية.

الكلمات المفتاحية: تكنولوجيا الإعلام والاتصال، أساتذة اللغة الإنجليزية كلغة أجنبية، التعليم العالي، الأساليب المختلطة المتسلسلة، نموذج UTAUT

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A Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctorate es Sciences in English Linguistics and Didactics

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