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Teachers' Attitudes towards the Use of ICTs

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On ...../...../2024

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Abstract

This study seeks to investigate the attitudes of EFL teachers towards the use of ICT into their teaching based on the related theories of Ajzen's (1991) Theory of Planned Behaviour (TPB), Roger's (1995) Innovation Diffusion theory (IDT), and Davis's (1989) Technology Acceptance Model (TAM). Employing a mixed-methods approach, the study explores teachers' ICT competence, Perceived Usefulness (PU), Perceived Ease of Usefulness (PEoU), Social Pressure, and ICT training needs. Findings gathered from a questionnaire administered to a random sample of 34 EFL teachers working in the English department of Tiaret University, and an interview conducted with a convenience sample encompasses 15 EFL students of 1st year master's degree Didactics at the same department during the academic year 2022-2023 do not only indicate positive attitudes of EFL teachers towards the integration of ICTs but also reveal a low level of ICT competence. In this respect, the study emphasises the improved and continuous ICT training for EFL teachers. In this regard, recommendations are addressed to policy-makers and educators; to provide adequate ICT training; in terms of content and frequency, and incorporate an ICT module, Education of ICT (EdICT), into the curriculum based on Technology, Pedagogy and Content Knowledge (TPACK) model. For future-teachers; it is recommended that the curriculum should focus on the integration of educational approaches with the evolving technologies including primarily Artificial Intelligence, AI for short.

Dedication

To my beloved father;

This thesis is dedicated to his memory. Though he is no longer with us, his values installed in me and influences continue to shape my journey.

To my mother;

I am grateful for your endless support and sacrifices you made in every challenge and success through this journey.

To my brother Missoum;

This thesis is dedicated to you, as a small indication of my immense gratitude for all that you have given me in my life.

To my sister, my brothers, their kids, and my whole family.

To my friend Salima.

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Statement of Authorship

I, Djahida ABDERRAHMANE, the author of this thesis, hereby declare that this thesis entitled Teachers' Attitudes towards the Use of ICTs has not been previously submitted for the fulfilments of any academic award at this or elsewhere at any other education institution. I affirm that all sources, data, ideas, and materials incorporated to this research work have been properly acknowledged through citation and referenced in the list of references. To the best of my knowledge, this dissertation does not comprise any previously published or written work by another author.

Signature:

Djahida ABDERRAHMANE

January 2024

List of Abbreviations

CAI: Computer- Assisted Instruction

CALI: Computer-Assisted Language Instruction

CALL: Computer-Assisted Language Learning

CBLT: Computer-Based Language Teaching

CELL: Computer-Enhanced Language Learning

CMC: Computer-Mediated Communication

DCA: Digital Competence Assessment

DLTs: Digital Learning Technologies

EdICT: Education of ICT

EFL: English as a Foreign Language

EFL: English as a Foreign Language

ICALL: Intelligent CALL

ICT: Information and Communication Technology

IDT: Innovation Diffusion Theory

ISTE: International Society for Technology in Education

IT: Information Technology

MALL: Mobile technology-Assisted Language Learning

MLEs: Modern Learning Environments

MVLE: Modern and Virtual Learning Environment

NBLT: Network-Based Language Learning

NES: The National Educational Standards

NETS: National Educational Technology Standards

OECD: Organization for Economic Cooperation and Development

PCK: Pedagogical Content Knowledge

PEoU: Perceived Ease of Usefulness

PU: Perceived Usefulness

TAM: Technology Acceptance Model

TCK: Technological Content Knowledge

TELL: Technology-Enhanced Language Learning

TPACK: Technology, Pedagogy, and Content Knowledge

TPB: Theory of Planned Behaviour

TPC: Technological Pedagogical Knowledge

TPK: Technological Pedagogical Knowledge

UNESCO: United Nations Educational, Scientific and Cultural Organization

VCL: Virtual Collaborative Learning

WELL: Web-Enhanced Language Learning

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Chapter One: Introduction and Background of the Study

1.1.Introduction

Information and Communication Technology (ICT) becomes one of the main building blocks of modern society. It prevails in many aspects. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has categorised education as a core societal priority (Castro, 2019). Due to the large presence of technology, teaching pedagogy has undergone a sea-change; the nature of, how with where learning and teaching take place have been all altered. To cater the 21st century learners' needs, infusing technology into education has developed to an imperative requirement. Clearly, technology has become the buzz word in every educational environment (chhabra, 2012).

In spite of the impression one might get that many technology affordances are ideal for language learning, their educational contributions and success may be difficult to list or document in words. In this scenario, as e-learning has become greatly insidious, omnipresent, and pervasive; especially, during and post Covid-19 arena, a kind of doubt, uncertainty, concern, and scepticism have also come into view. Much of attention is directed towards techno-centric teaching/learning modalities and how they are prioritised over face-to-face classroom instruction, in addition to the revaluation and revision of the existing teaching methodologies and pedagogies, as well as tracking the changing attitudes about and perceptions of e-learning.

As a matter of fact, the growing digital divide and attitudes in network-based educational settings strongly effect teachers' involvements and roles. It is widely acknowledged that new research at the cutting edge of interface design in technology integration for language teaching is a must. Teachers-related issues are discussed as an integral part in this research. Moreover, understanding the differences in attitudes among university EFL teachers and exploring the factors influencing their preferences and aversions towards technology use have long been of interest to social psychologists. Indeed, this constitutes a significant focal point of the research.

1.2.Background of the Study

Education; at present, is in a continuum process of transition to meet the demands and challenges of technological innovation while also addressing the needs of learners. To achieve the goal of using quality education, new technologies and approaches are being

implemented. Within this context, technology is promoted as a valuable mechanism for decreasing inequality in education (Graham, 2016 cited in Caster, 2019). Graham (2016) identified three ways in which technology is perceived by users: First by increasing the diversity of mechanisms and modes in education; second by reducing barriers to education as a democratisation mechanism; and third by empowering individual control over one's own education including content, delivery mode, and pace of learning.

Technology-assisted education offers the potential of enormous learning approaches including e-learning and blended learning. E-learning facilitates learning process for both on-campus, distant exchanges, fostering collaboration. Over time the integration of ICT in EFL teaching has evolved from an exclusively operational and technical towards knowledge-oriented cognitive, critical and responsible perspectives (Spante et al., 2018).

In order to align Higher Education (HE) with present technological advancements and globalisation, it is crucial to address teaching shortages, accessibility barriers, improve the quality of education. Additionally, create numerous opportunities for students to learn and increase their exposure to ICT supported teaching and learning processes are essential. However, despite substantial investments in content production and educational technologies such as Massive Open Online Courses (MOOCs) and Open Educational Resources (OERs), these promises have not yet been accomplished (Lalima & Lata Dangwal, 2017; Caster, 2019).

1.3.ICT, Higher Education, and EFL in Algeria

Over the last twenty years, there has been unprecedented growth and a worldwide impact of ICTs. As described by Castells (1996), the new world becomes informational, global, and networked. This has brought considerable attention to the integration of information technology into education and the necessity of making various decisions. Consequently, many countries have aimed at creating and developing an information society and economy to determine their optimal role in the global community

During, this technological and commercial boom; witnessed globally, there has been a new demand for an international language, a role falls to English. The advert of the internet and other electronic has further amplified the international importance of English, making vast quantities of English content accessible to learners all over the world (Chapelle,

2009). Within this context, many technologies intersect with the field of language teaching and learning, generating debates about their integration and potential impacts on professional practices, ultimately, benefiting learning outcomes. However, the rapid pace of technological changes; also, promotes considerations of how to effectively keep pace. Consequently, exploring the potentials of ICT integration in language teaching/learning becomes a must.

Researchers have undertaken extensive and thorough initiatives to offer comprehensive explanations within the discipline of language education. Their aim is to support the appropriate academic use of new technologies and establish the conceptual ground work for their pedagogical implementation. Consequently, achieving a broader understanding needs closer scrutiny of what justifies the consistency of research efforts in this demain.

Many countries have recognised the importance of English as a Foreign Language. English language and Information Technology are two major focal points of making EFL teaching and learning along with educational reforms worldwide, including Algeria. The Algerian Ministry of Higher Education has made remarkable efforts towards enhancing the quality of teaching and learning. By 2002, the Algerian Higher Education has undergone a process of modernisation, characterised by two significant reforms: the adoption and implementation of the European System Licence, Master, Doctorate (LMD) Degree and, the incorporation of ICTs in education (Mokhefi & Belaribi, 2016). They reported that in 2004, the Algerian Ministry of Higher Education established a Virtual National Commission of Education to establish and promote the Virtual University approximately across higher education institutions. This initiative aims to address multiple objectives including coping with the increased number of students, particularly those in remote areas, and promoting the culture of e-learning to harness its potential in the modern high-tech era.

As part of the digitalisation process, the Algerian government allocated significant funds towards ICT in education across educational institutions. This investment encompassed the construction, renovation and repair of infrastructure, as well as the provision of computers, audiovisual laboratories, networks, and other ICT equipments. Universities were rested with developing their own educational and research resources which included electronic pedagogical materials such as e-books, databases, scientific journals, and digitised pedagogical resources.

The provision and implementation of ICT facilities and services aim to ensure technology integration, educational innovations, and improve learners' and teachers' performances in information societies. To facilitate ICT-assisted instruction, operational and administrative measures were undertaken, including the assignment of designated staff members to identify the needs and requirements for ICT provision. These operations encompass the efficient use of ICT across the curriculum and promote multidimensional initiatives for cross-curricular planning.

Many questions have arisen regarding the Algerian government's decision regarding educational improvements plans through ICT integration, particularly in terms of supporting and encouraging the professional development of teachers and staff, as well as enhancing learners' educational achievements, in alignment with university policy and practices. It is imperative to consider how ICT can enhance the teaching and learning of various subjects including English and how ICT equipment and software are accessed, used, or acquired other than merely computing purposes. With the increased adoption of online and blended learning instruction in higher education institution, there is a growing research interest in exploring teachers' attitudes towards these applications. This research endeavour reflects a focus on understanding the complexities of how e-learning interacts with cognitive, affective, and behavioural components of teacher's behaviour, and examines its potential implications for educational purposes.

1.4.Statement of the problem

Discussions revolving around the development of ICTs' use in EFL teaching and learning highlight various stages and areas of research. A key problem arisen in determining ICTs and determining their use. Despite numerous perspectives ranging from technical support skills "know-how" to use digital tools and media to cognitive skills and social practices within digital societies there still little consensus about and understanding regarding ICTs integration and their use. The concept of ICT use remains ill-defined and misunderstood. In order to make informed decisions and implement ICT effectively, it is important to investigate and examine various factors. This study focuses on exploring teachers' attitudes as critical component of this inquiry.

In other words, despite the potential benefits offered by ICT and the efforts made, many teachers; who are the key component in the teaching/learning process, still do not use such

tools effectively facilitate the instructional outcomes. Despite ongoing efforts, it is pivotal to acknowledge that there remain significant gap to be bridged before claiming that classrooms are fully integrated with ICTs or that teachers possess with technology-driven pedagogy. ICT courses are not regularly adjusted and revised, and course content often fails to align with the evolving knowledge and pedagogical requirements of ICT implementation in EFL teaching/learning. Consequently, large number of teachers shows little interest in upgrading their professional and pedagogical knowledge and skills to form students with the ability to use the available technologies and meet the demands of the modern education.

Policymakers, practitioners, and teacher education programs have extremely discussed the positive outcomes that ICTs offer in EFL. However, despite this no or little training courses are offered to teachers. Moreover, in-services courses that are provided often show few examples of higher quality ICT integration and may contribute to a decline in productivity and the job performance. ICT training courses are extra scarce or inadequate. The limited availability of ICT training together with occasional in-service provided by the district fail to equip teachers with the necessary skills to effectively integrate ICTs into their teaching practices and enhance their performance. Undoubtedly, contentious aspect of this situation within the institutional context is the relationship of ICT knowledge to teachers' attitudes.

In the light of Covid-19, education has undergone unprecedented transformations and challenges, with online learning emerging as the only solution to ensure continuity of learning. Actually, this crisis has served as an eye-opening experience and has supported research to complexities if ICT integration beyond basic technical skills. Identifying various literacies, competences and knowledge required for effective ICT use presents a more intricate task. At this juncture, teachers' attributes and issues playing crucial in determining the successful integration of ICT in learning. As such, university EFL teachers have been the focus of this research work.

For the sake of simplicity and consistency with general practice, terms such as digital competence, ICT competence, and ICT knowledge are used interchangeably to refer to an individuals' ability to proficiently and effectively use digital educational technologies.

1.5.Purpose of the Study

The present study attempts to shed light on the reciprocal interactions several parameters, including teachers' attitudes, ICT integration in EFL context, ICT competence, teachers' perceived usefulness of ICTs, and ICT training. Specifically, it seeks to;

- Investigate the extent to which university EFL teachers' attitudes govern the educational use of ICTs.
- Explore the factors found within the context of EFL to be influencing EFL teachers' attitudes towards ICT integration in their teaching practices.
- Understand the ways in which EFL teachers' ICT competence and their perceptions of the effectiveness of ICTs direct their attitudes.
- Identify what ICT competences university EFL teachers should have to the uptake of ICT in EFL teaching and learning.
- Explore the value attributed to ICT training in developing teachers ICT competence, their professional development, and facilitating the process of integrating ICT.

1.5.1. Research Questions and Hypotheses

As discussed above, the symposium on which this thesis is based on was convened to discuss the relevance of the relationship between teachers' attitudes, ICT competence, perceived usefulness, and ICT training to the integration of ICTs in EFL learning. The rational that underlying this interconnectability is the assumption that ICT competence and ICT training positively impact teachers' attitudes positively and shape their perceptions towards digital technologies. To meet this end, the following research questions are asked:

1. What are the attitudes of EFL teachers at Ibn-khaldoun University of Tiaret towards the use of ICTs in EFL teaching and learning?
2. To what extent are ICT competence and ICT perceived usefulness likely to impact teachers' attitudes towards ICTs use?
3. To what extent are teachers generating differentiated models of teaching practices through the use of ICTs after Covid-19?
4. How does ICT training influence teachers' ICT use and their Continuing Professional Development (CPD)?

To answer the above mentioned questions, it is hypothesised that;

1. University EFL teachers are expected to have positive attitudes towards ICTs incorporation in EFL due to the educational affordances offered by digital technologies.
2. Factors such as ICT competence, Perceived ease of use of ICTs, and perceived usefulness are expected to have positive impact on University EFL teachers' attitudes and decision regarding technology-adoption.
3. The Covid-19 pandemic is anticipated to increase EFL teachers' adaptability, ICT competencies, and e-readiness to use digital technologies and resources in teaching practices.
4. ICT training is predicted to play crucial role in enhancing EFL teachers' professional skills and content knowledge thereby improving their attitudes towards ICT integration in teaching.

1.6.Significance of the Study

The insights from this area of study hold significant implications that may initially go unnoticed. Specifically, exploring teachers' attitudes towards the use of ICTs is essential for ensuring effective technology integration into EFL teaching. Attitudes are recognised as determinants of behaviour, making it essential to investigate the factors influencing teachers' decisions regarding technology adoption in their EFL classrooms. Furthermore, teaching pedagogies are inherently worthy of research. Therefore, examining the relationship between EFL teachers' attitudes and ICT competence, their perceptions towards ICT attributes, and social phenomena such as Covid-19, and ICT training is valuable. Additionally, identifying barriers and facilitators in the process of ICT implementation and understanding teachers' attitudes towards ICTs can greatly contribute to improving educational practices. In other words it can:

- Have a profound impact on the process of ICT integration into EFL education;
- Inform policy-makers and administrators about the need for investment in developing appropriate ICT infrastructure;
- Determine the know-how and know-what for better use of the available educational technologies;

- Inform teachers to develop the needed and effective strategies to improve the adequate use of educational technologies in the teaching/learning practices;
- Contribute to the design of ICT training and technical support;
- Guide the selection and incorporation of ICT resources and materials in curricular design;
- Provide insights to the importance of tailoring the available ICT training programs to address the constant changes occurring with technological growth and meet the unprecedented situations such as the global pandemic.

1.7.Definitions of Key terms

This glossary is founded to provide a deeper understanding of the most important terms adopted in this research.

Attitude: "an attitude represents a person's general feeling of favourableness or unfavourableness towards some stimulus object" (Fishbein & Ajzen, 1975, p. 216).

ICT: ICT stands for Information and Communication Technology (or technologies). Though there is no single, universal definition of *ICT* the term is generally accepted to mean all devices, networking components, applications and systems that combined allow people and organisations to interact in the digital world (UNESCO, 2009, p. 120).

ICT competence or **ICT knowledge**: Interchangeably; refers to the level of understanding of ICTs hardware components and software applications determined as fundamental for ICT incorporation and use in education.

Perceived Usefulness (PU): refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320).

Perceived ease of usefulness (PEoU): is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320).

Social pressure: Is determined as the *subjective norms* found in and the demands put on teachers in an educational setting to adopt ICTs; including, faculty policy, students' demands, government's educational reforms, and Covid-19.

Training: is determined as a short term job- oriented and mechanic process that makes use of a systematic and organised procedure to acquire behaviours, facts, ideas, technical knowledge, skills, etc., for a clear-cut objective (Reid, Barrington and Brown, 2004).

1.8.Delimitation of the Study

It is crucial to identify the delimitations of any research work to define its boundaries and clarify its scope. This process involves specifying the aspects of focus and what will not be addressed. In the present study, the focus is on exploring "Teachers Attitudes towards the Use of ICTs" in EFL context and understanding EFL teachers' attitudes and their ICT Competence, ICT perceived usefulness, social pressure, and ICT training, and ICT integration into EFL context. Therefore, age and geographic determinants are not addressed in this study. Additionally, due to the variability and instability of ICTs, no type of ICT is specified. In fact, the focus is on teachers' attitudes towards any device, component, system, or platform that enables interaction and communication in a digital environment. Similarly, as a current trend in ICT for EFL teaching and learning, AI (Artificial Intelligence) is considered as a form of ICT and discussion about its uses and contributions are recommended in the last chapter.

For a more targeted investigation, the researcher focuses on EFL teachers who are actively working. This precision aims to examine their actual use of ICTs in teaching practices, accurately measuring acceptance or rejection, as well as evaluating the adequacy and frequency of the provided ICT training courses. Limiting the study to the specific context of Ibn-Khaldoun Univerity of Tiaret allows for a more detailed examination of these factors.

1.9.Structure of the Thesis

As the title of this research work suggests, the examination of teachers' attitudes towards the use of ICTs is conducted to investigate the factors influencing teachers' acceptance or rejection of digital technologies in higher education. To achieve this goal effectively, this research is organised into six chapters.

The first chapter includes a brief overview of the study by describing the background of the study, highlights the research problems, research questions with hypotheses and the

purpose of the study. Terms used in the literature review and throughout the study are also described. The chapter also addresses the structure of the work and limitations.

The second chapter takes a step towards reviewing the existing literature on that framed the design of the present study. The concepts of ICTs' use growth in the field of education and EFL particularly, the emergence of new teaching/learning modalities and environments, attitudes formation, function and relation to behaviour, in addition to technology adoption theories together with the role of digital competence and ICT training in ICT integration are all discussed in this chapter.

The third chapter exclusively refers to sketch the direction includes a detailed explanation of the research methodology deployed in the study. Besides, it addresses participants, context of the study, instruments, data collection and data analysis procedures.

The fourth chapter is mainly concerned with the presentation of the findings and their interpretation which benchmark the extent to which attitudes of teachers can be good predictors of behaviour, as well as the additional factors that have an impact on both their attitudes and behaviours of integrating ICTs.

The fifth chapter of this study is pertained to suggesting some pedagogical implications and recommendations for the implementation of ICTs and tracing the evolution of these technologies including AI.

Finally, the sixth chapter provides a general conclusion and an overall sight of the research study together with the limitations encountered within this research work and suggestions for further research.

1.10. Conclusion

In this introductory chapter the researcher has presented the background of the study and described status of ICT all over the world in Algeria focusing on higher education and English departments as the context of the study. A number of key terms have been explained. The research questions, hypotheses and significance are all addressed. The next chapter will provide a detailed overview of the concepts of ICTs integration, teachers' roles and attitudes, digital competence and ICT training contributions in such integration.

Chapter Two: Literature Review

2.1.Introduction

Information and Communication Technology (or technologies) is implicated in so much of our daily activities. There become a large and open-ended number of areas of use where technology is relevant. At educational settings, however, the situation is very different and complex. At the heart of the aspiration to incorporate technology into education; precisely English language teaching and learning, there is a constant tension between technology use and teachers' attitudes. This chapter will provide a good illustration of the kind of problematic issues. Considerable insight into the changes in the diffusion and adoption of technology, and attitudes to its use, can be achieved by tracing the history of ICT through the 21st century. Different modes to ICT integration in education did not occur by chance, but in response to global economic and social changes, as well as to shifts in teaching/learning paradigms. Thus, each approach has its own particular stance, perspective, and ideology, thus discussed in this chapter. For a thorough critical discussion, this chapter has been attached to multiple research agendas and perspectives; from tangible descriptions of Higher Education practices to more normative approaches. With reference to specific historical perspectives and emerging trends, this chapter will benchmark the concepts of ICT, teachers' attitudes, digital literacy and competence, as well as ICT training.

2.2.ICT Overview

ICT; stands for Information and Communication Technology (or technologies), becomes an integral part of all spheres of life. It has brought an integral revolution to human every day activities. This rapid growth and tandem acceleration of globalization and technological changing processes contributed to advancing industries and creating a global economy with an information society which is powered by technology, fuelled by information and driven by knowledge.

In the early 1980s, the term Information Technology (IT) was first used to indicate the convergence of computer technology and communication technology. In the 1990s, ICT was widely used to replace IT; stressing the role of unified communications and telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information (Asafe, 2014). Similarly, Haddon

(2014) claimed that it was the 1990s that saw a substantial growth in commercial and academic research in the field of ICTs. Without having absolute boundaries, ICT defined as 'all kinds of electronic systems used for broadcasting, telecommunications and computer-mediated communications' (Dutton, 1999, p. 7 cited in Haddon, 2014).

In recent years the growth of technology has been further accelerated by a startling expansion in information and communication. In this regard, ICT is the combinations of information technology and communication technology. Perhaps it is best to clarify the words compose ICT.

Starting by Information Technology-as it is obvious, it is comprised of two words and to understand what it really means, one; before, has to know their meaning. Mansell et al. (2009, p. 37) described the terms;

> Information refers to "any communication or representation of knowledge such as facts, data or opinions in any medium or for, including textual, numerical, graphic Cartographic, narrative or audiovisual forms.
>
> Technology refers to "the practical form of scientific knowledge or the science of application of knowledge to practical."

Putting them together Information Technology refers to any software application on operating systems or hardware applications (including computers, videos, telephones and related equipments of telecommunications, tapes, CDs, etc) that is used in the acquisition, storage manipulation, management transmission or reception of data or information (Mansell et al., 2009)

Turning to the second key concept, Mansell et al. (2009) postulated that Communication Technology consists also of tow words. Technology has been already discussed. Communication is determined as the exchange of information. It is "the process of transferring information from a sender to a receiver with the use of a medium in which the communication information is understood by both sender and receiver" (p. 38). Obviously, communication technology facilitates communication among individuals or groups who are not physically present at a common location, through electronic systems such as telephone, telex, Fax, radio, T.V. and Video are included, in addition to the more

recent computer-based technologies, including electronic data interchange and e-mail (Voogt & Knezek, 2008).

The combination of these concepts and examples draw a general definition and conveys a sense of what ICTs can include. Generally, ICT can be defined as a common term referring to a diverse set of technological tools and resources used to transmit, store, create, share or exchange information. These technological tools and resources include computers, the Internet (websites, blogs and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices) and telephony (fixed or mobile, satellite, visio/video-conferencing, etc.) (UNESCO, 2009).

As the term progressed, UNESCO (2009) noted that ICT covers any product that will store, retrieve, manipulate, and transmit or receiving information electronically in a digital form. Meenakshi (2013) describes ICTs as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." (p. 3). All the same, Moursund (2005, p. 4) declared that:

> It is assumed that both science and technology are combined within the field of ICTs which consist of the full range of computer hardware and software, telecommunication and cell phones, the Internet and Web, wired and wireless networks, digital still and video cameras, robotics, and so on. It includes the field of Computer and Information Science and a huge and rapidly growing knowledge base that is being developed by practitioners and researchers.

In similar vein, American Library Association (1983, cited in Petal & Darbar, 2017) defined information communication technology (ICT) as:

> the application of computers and other technologies to the acquisition, organization, storage, retrieval, and dissemination of information. The computers are used to process and store data, while telecommunication technology provides information communication tools, which make it possible for users to access databases and link them with other computer networks at different locations.

Lisbdnetwork (2014); further, stated that ICT can be all sorts of electronic systems used to mediate communication, process and store data, as well as transfer and disseminate digital information. In other terms, ICT is the incorporation of computing, networking, and information processing technologies and their applications. So, ICT namely encompasses three key components that are; technology, information that is delivered owing to the aid of technology, and communication being a process that technology facilitates and a means for information dissemination too.

The constantly changing nature of technology together with the ongoing development of these technological advancements; makes it difficult to give one definite description for ICT; one may come cross a various definitions. ICTs can be regarded (viewed) in a diversity of ways. It is important to consider that ICT is an umbrella term that encompasses the older and most traditional technologies; called "analogue media", such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film, in addition to the latest computer and Internet based technologies named as "digital media". In today's world these tow media are able to function together and combine to create our "networked world" (Nadera, 2015).

This fast growing range of new digital communication technologies is altering multiple aspects of the profession due to the plethora of new services and materials that appeared. It seems critical (paramount) to point out these changes explicitly. This new situation indicates that, for a large proportion of world's countries it is mandatory to create a technologically literate workforce. Hence, technology use is a major education need. However, many questions seem to be raised such as: In what ways may ICTs serve as tools and contribute in the reshaping of Education nowadays? What factors and who are involved in the adoption and rejection of ICTs on both the personal and educational levels? What is the 'additionality' of ICT in today's classrooms and its contribution to amplify the quality of education? Additionality encompasses the supplementary values and potentials that ICT offers to particular educational setting or environment.

For these reasons, ways of analysing people's experience of these technologies and potential educational implications and the ways of embedding technology generated tremendous personal and academic interests; accompanied by globalization (both as cause and effect).

2.3.ICT and Education: Changes and Pedagogical Implications Offered by ICTs

Throughout human history, humans have been in a continuous thinking of upgrading tools to reinforce their capacities and performances of their bodies and minds, noticeably, the evolution of education through time has made the educational system confronted with frequent change so as to fittingly accommodate with the changing tools (Moursund, 2005). In the last few decades, Policy- makers, educationists, practitioners and academics are developing guiding principles, strategies and policies on ICTs in education. Seemingly, many programmes and measurements are undertaken for innovation and teaching amelioration sake. Therefore, ICTs have always been directly or indirectly present in all government measures taken in education. Specifically speaking, prospects for learning sustenance, social construction of knowledge and development of learners' autonomy in terms of skills and competences have all been enabled by ICTs (Hernández et al., 2019).

ICT permeates educational systems. It changes their nature and purposes. It generates new global educational trends. A number of studies have postulated that all these developments of in Information and Communication Technologies' tools demonstrate a potential power for educational change and reform (Weert & Kendall 2013, Lowther, et al. 2008, Shan Fu, 2013). ICTs can facilitate increase access to education, reinforce the relevance of education to the increasingly digital workplace, and bridge the gap between teaching and learning with real life; especially when appropriately implemented.

2.3.1. A Shift from Teacher-Centeredness to learner-Cantered Approach

It seems possible to say that schools have to be well equipped with these technologies since information availability, access to it, and technology continues to grow rapidly. They have to become compatible with expanding access of knowledge to be able to process it, other than, being limited to knowledge transmission with a given period of time. From 1980s to the current time, is a period that witnesses the peak evolution of educational use of ICT from standalone data processors in computer labs, to accessing the Web, to being able to provide integrated Web services for teaching and learning, resource collections, student records, administration, professional development and community relations now (Nadera, 2015).

There are pressing issues, affecting the field of education throughout history. Different social stances, political ideologies, and learners' needs have led to the emergence of various approaches to both defining the nature of learning and teaching. A shift from fact memorisation, rote learning, lecturing and drilling; to an emphasis on high order thinking and future-ready skills such as critical thinking and problem solving have been witnessed recently in the field of education. From several lines of evidence in a work conducted by UNESCO (2009, p. 10), it has been recognised that:

> Rapid global technological and economic developments have placed greater demands on education systems. The need to inculcate among students the importance of lifelong learning, that is, to constantly seek new information, to think critically and to take initiative has become ever more pressing in our fast-changing world.

Within this situation; obviously, "ICT has proven to be a valuable aid to solving problems and accomplishing tasks in business, industry, government, education, and many other human endeavours" (Moursund, 2005, p. 4). Explained in other words, seeking a way to remedy the former traditional undertaken way of teaching drawbacks, a process of realignment put into practice as an urgent need at all levels for education. The role of EFL to the indispensible incorporation of technology into the process of teaching and learning to bring vitality and vigour. Technology seems to be " a powerful tool with enormous potential for changing outdated educational systems to systems capable of providing learning opportunities for all, to better serve the needs of twenty-first century learning, communications, work, and life" (Thomas & Knezek, 2008, p. 335).

In point of fact, conventional teaching methods considered learners as empty vessels, where teachers have the absolute authority and responsibility for the whole learning process. The out – dated teaching pedagogies are contradictory to contemporary learners' needs, it goes without saying that the traditional text book does not fulfil the necessary requirements in a world of speedy shifting and information blowups. On this light, the teaching profession is going forward from teacher- centeredness to a modern learning environment where the learner in the heart of the process.

In his work ICT in Education: its Benefits, Difficulties, and Organizational Development Issues, Suryani (2010) acknowledged that technology's use breaks the

monotony of traditional classes and brings true-to-life atmosphere and materials such as whiteboards, online resources and online communication; instead of face- to face classroom interaction, are taking much attention. The use of ICT gradually alters the conventional teaching pedagogy to make today's classrooms interactive where active learning takes place. Clearly, learners are self-managed and self-directed; a kind of independent and autonomous learning.

In the same way, Syslo (2004, p. 101) lists valuable features of ICTs in learning contexts which are:

- Flexibility in terms of time and space; an anytime and anywhere approach to learning, online learning environments, distance education;
- Flexibility in terms of content, information and people; ideas, and resolutions to problems.
- Creating web- mediated learning environments and web resources;
- Altering the field of education from supply (of information and knowledge) to demand (just in time, just fit) approach;
- Assuring person- to- person communication, interaction and collaboration; synchronous and asynchronous.
- Providing real- world learning contexts (learning by doing), for instance through computer modeling and simulation, e-learning in distance education.

Hernández-Ramos et al. (2014) stated that ICTs have become an intersecting axle of all educational practices where they deliver three salient functions: they are an instrument in learning processes, a tool for information processing and implicit learning content. Moreover, technology opens access to digital libraries. Moursund (2004) noted that libraries are so important for problem- solving; they are considered as an exceeding point since many ideas and tasks are build on previous works. To communicate with others for the building on their works internet is used. At this point, the importance of technology in education can be seen.

Thomas and Knezek (2008) suggest that the role of digital tools and resources in education calls for the development and application of ICT standards in schools. These standards are founded to ensure establishing, communicating, meeting, and assessing expectations related to ICT in schools. These latter focus efforts and commitment, they

certify alignment of materials and resources, curriculum, instruction, and assessment. Apparently, learning is a lifelong activity that departs from traditional approaches and as time goes by, learners' expectations in looking for knowledge changes as they will be willing to use ICT seeking about new resources for knowledge which means developing ICT skills are a prerequisite for teachers and learners (Shan Fu, 2013).

2.3.2. Improving Teaching/Learning Quality and Access to Course Content

Shan Fu's (2013) comprehensive review concluded that the quality of teaching and learning improves via ICT use when three characteristics are found: autonomy, capability, and creativity. Autonomy means that learners can rely on themselves in learning while using ICT and are able to deal with others. Teachers are mentors who can direct and guide learners to accomplish certain tasks and work collaboratively in a group of individuals. Teachers foster learners' autonomy with ICTs by creating specific teaching/learning materials and having control over course content. Through this, learners become more confident to undergo new challenges and build new knowledge to their background knowledge. With regard to capability, once learners are autonomous in conducting their learning, they become capable of applying and transferring knowledge while using technology in an efficient way. The two former components lead learners to become more creative in creating and discovering new learning multimedia tools and materials that meet their learning' s needs whereby course format and content changes too pressing a duty on teachers performances to make plans, decisions, and so forth. Much more is explained below when describing these learners.

2.3.3. 21st Learners' Characteristics

To fit the 21st learners out with knowledge and skills that they need in the present digital world, the focus of modern teaching on technology is to create an innovative modern learning environment. Weert and Kendall (2003) labelled today's generation of students as "Media Generation" that is knocking the doors of higher education and can be seen to have new competencies that Weert and Kendall identify below:

- Multi-dimensional scanning: Students of this new generation are able to absorb text, sound, movement, colour and image at the same time and integrate discontinuous information.

- Multi-tasking: They can process multiple tasks at the same time and in a non-sequential way.
- Virtual Environment: Media generation are able to perform several virtual actions and live in a world of unreality.

Continuing to demonstrate the impact of ICT on learners, Mellor (2007) claimed that Learners who use ICT for basic skills double the value of their study time; acquiring two sets of skills at the same time, they learn how to learn rather than focusing on acquiring merely a specific skill, getting new information or accomplishing a given task. Apparently, this leads to a kind of meta-cognitive learning which can be further divided to self-appraisal; the ability to reflect and evaluate one's own knowledge, competency and development, and self-management that is being capable of planning, selecting and using the most preferable appropriate learning strategies (Phelps et al., 2004; Suryani, 2010, Sánchez & Alemán, 2011).

Brush et al. (2008) study showed that learners can search for the information that they need to get better understanding due to the proliferate access to internet. Dynamic and collaborative learning are facilitated through the use of technology anywhere at any time, i.e., it permits learners to overcome the demographic limits. Obviously, it enables them to get contact with learners from the same or rural areas and even with teachers from different countries, at anytime and anywhere. In as much as, it guarantees interactivity and communication. Besides this dynamicity and collaboration learning, communities of learning can be formed due to the principals, administrators, teachers, IT coordinators, and the students. Pure and simple, technology promotes a journey of exploration by keeping both teachers and learners up-to-date; it makes them informed of all the new researches.

In this connection, Suryani (2010) pointed out that ICT can develop children's literacy. It can provide cognitive, motivational and interactive advantages. Learners are highly engaged and motivated when using ICT in learning than through memorisation; they have fun. The use of technology is limitless in terms of time and space especially when it greases the wheels for children or learners with disabilities to get involved in many kinds of learning. By this, learning a new technology cannot be complex or difficult. In a nutshell, through the use of ICTs as a supporting means; complex processes or innovative learning experiences can be possible or achievable.

2.4.ICT in EFL: From CALL to Virtual Classrooms

The triumphal entry of ICTs into the field of education, precisely, facilitated the learning of many languages; English got the lion's share of this assistance, consequently, what have led to reshape EFL pedagogy (Rababah et al, 2012). For a long period of time language teaching methodology has witnessed several changes because each method proved a poor outcomes and the learners were uncreative even unable to generate linguistic stretches to meet unexpected needs in whatsoever new circumstances. Therefore, there was a shift to a new concern that had been emerged and drawn among language teaching specialist. It is no more teacher's knowledge transmission, whereas, a focus spots light on the learner's competence construction. Johnston and Barker (2002) found that the use of technology has a crucial role in the upliftment of language teaching and learning as it brings to the fore the communicative revolution. Its use becomes mandatory.

2.4.1. An overview of CALL in EFL

The shift of change in language learning and teaching philosophy has put a vigorous insistence on student- centred learning that permits learners to take part of their learning and work on their own. Computers; as a helpful and remedial tool, fell out of favour among language specialists.

The recent years have displayed a polarization of curiosity to use computers in language learning and teaching leading to the birth of Computer Assisted Language Learning (CALL) approach. Levy (1997, p. 1) defines it as "the search for and study of applications of the computer in language teaching and learning", Beatty (2010, p. 7) determines it as "any process in which a learner uses a computer and, as a result, improves his or her language". He further prescribes it as a broad field that embraces issues of materials design; purpose-made for language learning, technologies, pedagogical theories and modes of instruction.

At the early stages of computer use in language classrooms, the interest was of a minority of specialists. Lately, its use became a salient issue for a colossal number of language teachers across the universe, mainly, due to internet and multimedia advancement.

It was not only until the early 1960s that researchers considered computers' use on language learning worthy of scholarly attention. The embodiment of CALL dates back to the late 1950s when technology was acknowledged to be integrated in language instruction. The term CALL was extracted from the broad term Computer- Assisted Language Instruction (CALI) which this later derived its origins from the term Computer-Assisted Instruction (CAI). In terms of language learning, CALI underpinned the teacher-centered approach; transmission mode of pedagogy that many expert language teachers and specialist rejected, to be in favour of making learners active agents in learning experiences, in this regard, CALL has a positive role (Davies & Higgins, 1982; Khamkhien, 2012; Thomas et al., 2013)

Over the last forty years, the expanding academic field of CALL delves into examining the role of ICTs in language teaching and learning; encompassing a wide range of applications and approaches, that transcends from the traditional drill- and practice exercises to innovative technological teaching and learning opportunities. An early reference to the use of computers in language teaching and learning can be found in Teaching & Researching: Computer-Assisted Language Learning by Beatty (2010) who reported the evolution of computer- based language tools and how the countless applications become pervasive and invisible. These devices included mechanical telephone query systems that act in response to short snippets of natural speech to determine simple words and phrases and elucidate intentions. However, the great number of users who slipped from a select group of erudite computer professionals, made others computer-based language functions integration an obligation, such as word processing, email, software that corrects spelling and grammar, and providing thesaurus functions. CALL programs integrated into language learning increasingly evolved to be extended to incubate and use concordances, interactive whiteboards, Computer-Mediated Communication (CMC), language learning in virtual worlds and Mobile-Assisted Language Learning (MALL), nonetheless, encompassing virtual learning environment and web-based distance learning (Khamkhien, 2012, p. 56).

In his own major work, Beatty (2010) also pointed out that:

> The field of CALL is also constantly undergoing change because of technological innovation that creates opportunities to revisit old findings, to conduct new research and to challenge established beliefs about the way in

> which teaching and learning can be carried out with and without human teacher. (Beatty, 2010, p. 1)

Warschauer and Healey (1998) identified that the progress of CALL went through three different phases: Behaviouristic CALL, Communicative CALL, and Integrative CALL. Each stage corresponds to a particular level of technology and a given pedagogical approach. They described these stages as follow;

The Behaviouristic CALL which was regarded as a sub-component of the broader field of CAI. It was conceived in the 1950s but put into practice 1960s and 1970s. Repetitive language drills; referred to as drill-and-practice, were what featured this mode of CALL. This behaviourist mode of learning considered the computer as a mechanical tutor and allowed learners to proceed work at their own rate; and through extensive drills, grammatical explanations and translation tests at various intervals.

Next, Communicative CALL appeared by the late of 1970s and early 1980s, it banned both theoretical and pedagogical perspectives of the behaviouristic approach to language teaching and enforced the new possibilities that personal computers could offer for individual work we. In this paradigm, Communicative CALL advocated a direct attention from an emphasis on form of language system on an emphasis on use of that system and communication. Consequently, this phase of CALL focused on teaching grammar implicitly rather than explicitly and allows and encourages students to do things with the target language effectively, appropriately, and fluently. This shift of emphasis had far-reaching consequences based on the perspectives of cognitive theories which deemed learning as process of discovery, expression, and development. At the same time, well-accepted CALL software developed embraced text reconstruction programs (which prompted students working individually or in groups to rearrange words and texts to discover patterns of language and meaning) and simulations (which stimulated discussion and discovery among students working in pairs or groups) (Warschauer & Healey, 1998, p. 57).

By the late 1980s and early 1990s, a move from cognitive view of communicative teaching to a more socio-cognitive view was witnessed; reassessing communicative language teaching and learning practices, since many central elements of the language learning process were marginalised which computers were used. Within this movement, a great emphasis was placed on language use in authentic social contexts. The aim was to

integrate learners in authentic environments and to integrate the multiple skills of language learning and use via tack-based, project-based, and content-based approaches. Considering all this, a new perspective to language learning and technology came to ground called Integrative or constructivist CALL. This stage to CALL stressed the integration of language skills (listening, speaking, reading, and writing) with technology to the language learning process. In this integrative CALL learners learn to use a "variety technological tools as an ongoing process to of language learning and use, rather than visiting the computer lab on a once a week basis for isolated exercises (whether the exercises be behaviouristic or communicative)." (p. 58). These computer-mediated means, for example, can internet, World Wide Web, computer-based reference resources, and much more.

The previous section has shown that each one of the three stages mentioned above focuses on the use of technology in language learning- either, being a mainframe in the behaviouristic CALL, PC in the communicative CALL, or the multimedia networked computer in the integrative CALL. In conclusion, the use of technology into the language learning has been an ongoing process that provides a range of informational, communicative, web-based distance learning, virtual learning environments, and digital tools. They also extend to include, interactive whiteboards, virtual words and mobile-assisted language leaning (MALL) together with computer-mediated communication (CMC). The multiple software, computers, and multimedia programs can immerse learners into rich environments for language practice, global interconnectedness. Also, they can present authentic contexts for language use and communicate in this target language together with the access to textual and multimedia information.

Bates et al. (1993, cited in Warschauer & Healey, 1998) highlighted that the use of technology in language learning; labelled it as the intelligent use of CALL, will improve three Knowledge acquisition from natural language texts of various kinds, from interaction with human beings, and from other sources' to produce wider knowledge bases than those that previously exist. Eventually, such technology affordances affect language skill-building.

2.4.2. ICT and Language skills

Listening

The effects of ICT on improving language learners' listening skills are tremendous. As clearly known that listening skill is a key determinant in learners' language acquisition and- also, it is an intricate skill to teach. Pronunciation in producing or understanding imposes a serious issue for non-native speakers. Through a variety of multimedia instruments and digital tools such as digital stories, audio records, and podcasts language learners can develop their listening skills and be motivated way more to take part in their learning rather than being passive listeners (Nachoua, 2012, Drigas & Charami, 2014).

For example, Verdugo et al. (2007) argued that digital stories combine interactivity, visual, and repetition that enthuse language learners especially children and make them improve this skill effortlessly. Activities should be fun and motivational to help learners develop structure, literacy, vocabulary, and sound pattern which in turn lead language learners to learn the language. It is also significant to mention that such technological tools and resources should neither exceed learners' linguistic level nor their technological abilities. It is also crucial to mention that teaching listening comprehension is difficult but through recordings learners' understanding can be increased. They enable them to pause and replay the parts that they inadequately understood which means these recordings allow and enable them to handle incoming spoken language and develop self-regulation strategies for learning.

At this juncture, it is vital to point out that listening provides learners with large amount of language input and with technology it becomes available to larger groups of population. Such websites or internet in general encourages learners to practice listening skill. They could repeat listening material several times till they master or get the information (Khamkhien, 2012, Drigas & Charami, 2014).

Speaking

Once ICTs are used wisely, they have a useful contribution to oral skills. EFL and e-leaning principles together with techniques that stimulate interaction, integrating vocabulary and use of English all together in stress-free environment are meant to motivate learners to participate and produce spoken language (Drigas & Charami, 2014). As the

technological tools provide pre-recorded messages, they afford learners synchronous chat in a virtual class. They create an authentic context for real experiences via communication and discussion (Hashemis & Azizinezhad, 2011). Waddel (2011) suggested that digital tools and videoconferencing enhance learners' creative thinking, flexibility, originality, and elaboration along with inspiration, motivation and confidence that all will offer more chances to internalise language and at the same time improve their technological skills. Gromik (2012) also argued that mobile phones also enhance language learning; using their audio and video features, learners are engaged in discussions, able to share their thoughts and interact with their peers. However, it is paramount to state that it is teacher's role to guide facilitate such process and identify clear learning strategies along with the integration of effective literacy activities.

Reading

As for reading skill a wide range of studies found to explain the benefits that ICTs afford for learners to develop their reading skill and other related-lieracies. Drigas and Charami (2014) assumed that this magic tool of internet encourages learners to visit online book clubs and interact with several readers which can motivate them and help them improve their critical thinking. It is that technology-enhanced environment improves academic performances and multiplies comprehension. Hence the creation of web-based reading programs becomes mandatory to allow learners, especially university learners, to develop their own online reading strategies to amplify their reading comprehension and understanding. Most importantly this will permit learners to have the autonomy to access the resources that ICTs made available and be able to mentor their learning. Knowing how to use these new tools and to manage them effectively make learners feel less anxious, have positive attitudes towards collaboration and problem solving. All these positive experiences with the use of technology and reading activities are likely to make learners gain more.

As technology has penetrated today's classrooms, e-books seem to an appealing and an intriguing method to present reading in classes. They offer several potentials, for instance, e-books reading endorse comprehension and introduce a wide range of reading materials. Digital dictionaries also contribute in facilitating reading when learners refer to understand unknown words. It is as well as crucial to cite that learners can be divided as digital

readers, non struggling readers, and struggling readers and collaboration can allow digital readers help the two others (Sternberg et al., 2007, Larson, 2010). In sum, through the use of technology and appropriate educational activities and practices higher goals will be reached within the field of education in general and EFL in particular.

Writing

Writing skill is another area where ICT has added a great deal of value. Data from several studies suggest that these new tools which invaded today's classrooms facilitate this skill to a great extent. Aziz et al. (2013) conducted a study in which classes have been divided into three types: the first was traditional "face-to-face way", the second was the "integrative way" which employed both traditional teaching with web-based teaching and materials, and the third was fully "web-based way" of teaching. Results from this study revealed that learners' level has significantly changed and improved within the integrated method. This blended approach allows students to share and construct knowledge.

Arslan et al. (2010) study investigates the ways in which the use of blog Software and Tweeter as tools would help learners practice the written language. Findings showed that these tools engage learners and blogging enables them to share their thoughts and feelings and reflect on them as well through the language they wish to learn, rather than attending in-class session. Moreover, learners can create community bonds that allow them to know more about each other and discuss differences in written language. Teachers, therefore, have to make use of such tools, online platforms, forums, blogs, wikis, and more to promote the production of written language and enhance writing performances (Drigas & Charami, 2014).

2.4.3. Learning Theories and their Underpinnings for Modern Teaching/ Learning

Thinking about education in general and EFL profession in particular from critical technologically-informed pragmatic perspective implies that careful considerations should be directed to the development of appropriate curriculum and programs and clarify the approach to technology use. The integration of ICTs was linked to a variety of learning paradigms and teaching methods. Below are different theories associated with technology-enhanced learning/teaching in general and with EFL in particular to better understand the

concepts underlying technology's integration principles. Strictly speaking, it is not the scope in this section to go deep into the details of all the learning theories and approaches. The chief concern is rather to explain the main learning paradigms and their practical and instructional applications to learning in general and ICT integration into EFL in particular.

2.4.3.1 Behaviourism

Anciently, with emergence of *Behaviourism*, Schunk (2012) stated that learning was viewed as a change in the rate, frequency of occurrence, or form of behaviour or response, i.e., "emphasising the forming of associations between stimuli and responses through selective reinforcement" (p. 25). Pointedly, it was argued of correct responding that learning involves the formation of associations between stimuli and responses (Schunk, 2012). This theory contends learning in terms of observable phenomena. Internal events such as thoughts, beliefs, and emotions are not included, not because they don't exist, but because the causes of learning are observable environment events (p.22). Skinner (1953, cited in Schunk, 2012) points out that behavioural theories emphasise the role of the environment, particularly how stimuli are regulated and presented and the ways responses are reinforced.

2.4.3.2 Cognitivism

Conversely, Cognitivism views learning as an "internal mental phenomenon inferred from what people say and do" And "it is a combination of factors such as factors as information processing, memory networks, and student perceptions and interpretations of classroom factors (teachers, peers, materials, organization)" (Schunk, p. 25). Respectively, he argues that the core theme of this theory is the mental processing of information: Its construction, acquisition, organization, coding, rehearsal, storage in memory, and retrieval or nonretrieval from memory (p. 22). He further state that this theory assigns a prominent role to learners' thoughts, beliefs, attitudes, and values because the way they perceive the importance of a given task and the extent to which they are capable of doing it can affect their learning. This latter is a milestone issue that teachers should consider in lesson planning, importantly enabling learners to apply knowledge in different settings systematically. Teachers should provide them also with the feedback about how to use skills and strategies to regulate their activities.

The role of society/context and psychology are not rejected by cognitive theories. Advocates of much of human learning occurs in a social environment; observing others, and how internal emotional incentives for learning led to the emergence of Social Cognitive and Cognitive psychology theories. Observing the constant change in learning paradigms and limits that cognitive theories fail to capture the intricacy of learning, other theories came to light.

2.4.3.3 Constructivism

Increasingly, Constructivism which is a psychological and philosophical perspective has been applied to learning and teaching. Johassen (1991, cited in Ratheeswari, 2018) defines constructivism as "a paradigm of learning that assumes learning as a process individuals ''construct'' meaning or new knowledge based on their prior knowledge and experience." (p. 45). A more fundamental idea to constructivism traced back hundred years ago associated with much of the work done by John Dewey (1859-1952) to the more recent research by Bruner, and much influenced by Piaget's and Vygotsky's theories about human development and the nature of learning (Moursund, 2005).

As stated above , Constructivism contends that learning occurs when a learner constructs new knowledge and understanding on top of, and integrated with his or her current knowledge and understanding. Constructivist theory stresses participants' active engagement in critical thinking, problem solving, search for meaning and understanding and metacognition (Moursund, 2005, p. 18). "Constructivist learning is always an interpretative process involving individual's constructions of meaning relating to specific occurrences and phenomena. New constructions are built through their relation to prior knowledge." (Watts, 1994, p.32, cited in Gatta & Vella, 2003).

2.4.3.4 Connectivism

Today a number of researchers have shifted even more toward a focus on technology use in learning because each generation learns at its own pace and standards. In 2008, George Siemens and Stephen Downes develop a theory; they first introduced in 2005, which fits into the digital age; named as Connectivism. It has been commonly associated with the use of technology. This theory contends that individuals drive their competence from forming connections (Howell, 2014). It holds the view that knowledge exists in the

world more than being just an internal construction process. In light with this view, knowledge is found within systems that people access while participating in activities.

In Connectivism, learning seems to occur through making connections and links of several nodes of information to form knowledge in networks (Siemens, 2005) and through "the ability to see connections between information sources and to maintain that connection to facilitate continual learning" (Duke et al., 2013, p. 6). Connectivism is about creating connections and developing networks. Networks' growth involves an interaction between individuals' capacities and invented technologies. Since learners cannot experience everything they can learn better through collaboration (Duke et al., 2013). Howell (2014) illustrates how this network generates a notion of know-where, i.e., the understanding of where to find the knowledge when it is needed, to supplement to the ones of know-how and know-what. He stated that according to the theory of Connectivism learning can reside outside of the individuals for example learning can be found in an organisation, in a database, or other non-human appliances. In his landmark paper, Connectivism: A Learning Theory for the Digital Age, Siemens (2005:5) outlined eight principles of Connectivism:

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

All of these developments of Connectivism differ markedly from the several teaching and learning approaches that preceded it. The emphasis becomes quite different. It has contributed to a growing interest in the analysis of technology use. Connectivism has

popularly adopted approach to the fact that "with increasing technological connection through the Internet, digital cities that collaborate on a wide array of topics have become a collective network that links communities both locally and globally" (Duke et al., 2013, p. 7). In oppositions and continuous debates, Kop and Hill (2008) argued that Connectivism can be a part of an existing learning theory, where methods of instruction are influenced by several technologies in numerous ways. In agreement with viewpoint, learning and teaching is about electing the positive sides of each theory to create appropriate instruction.

In a nutshell, the former conceptualisations of learning provide significant implications for educational practices including teachers' performances, environments creation, students' achievements and more. For instance, behavioural theory suggests that teachers should modulate, regulate, and arrange the learning environment to permit learners respond appropriately to stimuli (technological materials). The cognitive theory implies the role of teachers in creating the instructional content and environment that support the development of learners' thinking and understandings; taking into account learners' needs and their perceptions towards themselves. Among the implications that Constructivism imply to instruction and curriculum design, it is that focusing on the design of group activities to enhance the acquisition of collaborative skills that go with contemporary culture of learning environments where learners with several levels, background and prior experience are found and interaction is boosted (Gatta & Vella, 2003; Moursund, 2005). It postulates that teachers should use materials that make learners actively involved and premise experiences that challenge their thinking and allow them to regulate or rearrange their beliefs; underlying the emphasis on reflective teaching (Schunk, 2012). The acquisition of any competency requires environmental input; therefore, Connectivism presents a model of learning that recognises the constant changes in society where learning is no longer internal or individualistic activity and costs light on the required skills and tasks for learners to perform well in a high- tech era and information rich time (Siemens, 2005).

Before moving on, it is worth spelling some overlapping intersections between the mentioned learning theories. Among the commonalities that exist between the different forms and approaches of learning is that concentration upon appropriate learning environment determines how information is learned. In response to adequate cues available in this environment, appropriate memory structures are activated to process (*encoding*), retrieve, and store information in an organised meaningful way (Schunk, 2012) and from

what is presented in the leaning context, learners will be given the opportunity to construct personal meanings and apply them in real-life circumstances. As technology affects all theoretical viewpoints, Connectivism can serve as a significant instructional guide to improve the preceding learning theories for their implementation to a globalised and networked world (Ally, 2007, cited in Duke et al., 2013).

In practice, considering the principles of theses learning theories imply frameworks for bridging the gap between research and educational practices and provide tools to arrange and regulate instructional environments. Every research is based on a theory and the founded findings sufficiently identify situational factors to organise that knowledge which contributes in the advance of the field of learning and promote teaching, Merriam and Caffarella (1991, cited in Duke et al., 2013, p. 6) argue that a learning theory provides a resource for the educator to solve a practical problem in a practical situation. Explicitly speaking, the former theories determine technology integration in learning and the ways in which teachers make use of the available technological tools.

The explosion in technology that has occurred in recent years comes out with the concepts of educational technology, instructional technology and technology of education which are used when referring to the role of technology use in learning or teaching. Howell (2013) describes them as follow. Educational technology Educational technology includes, but is not limited to, sotware and hardware, as well as internet applications such as wikis and blogs, and activities. Instructional technology refers to the theory and practice of design, development, utilisation, management, and evaluation of processes and resources for learning. Technology of education is regarded as a range of tools that might contribute in enhancing students' learning and can be measured in how and why individuals behave. In this respect, the term technology seems to cover objects and tools such as overhead projectors, laptop computers and Calculators (p.79). Technology Education will be further explained.

The evidence reviewed here seems to suggest that traditional pedagogical models have been redefined when telematic networks and internet; being container and transmitter of information and that computers become fundamental to various educational operations, reshaped teaching and learning systems. These networks led to the emergence of Modern Learning Environments (MLEs) as the birth of new teaching learning modalities where the up-to date radical and profound pedagogical changes are required.

2.5.ICT and the Modern Learning Environments (MLEs): New Pedagogical Modalities in High-Tech Era

The integration of ICTs into education present the flexiblisation of time-space which increases interaction and reception of information which whereby introduces new communication models and teaching methods used by teachers that in turn gives way to both individual and collaborative learning (Almenara, 2001). It is vital to point out that the fact that teachers are shifting parts of their curriculum and learning tasks to the web, the boundaries between conventional education and online education are fading away to give birth to blended, distributed, and other hybrid learning milieus (White, 2006).

As far as the emerging ICT-based tools and technologies are concerned, a series of new pedagogical modalities become available and make a notable transfer or rather an evolution from using audio-visual aids and desktop computers to virtual and online platforms. Despite the fact that the emerging technologies were not wrought to language learning, they are being exploited in two together formal and informal language learning/teaching.

2.5.1. E- Learning

E-learning; often linked to the dot-com boom, presents a different and innovative learning environment for students, thus increasingly becomes important in higher education institutions. Large volumes of information from multiple resources are found. The growth and presentation of several E-learning tools; from using internet to digital portfolios and virtual learning environment, become among the pivotal ways to enable learning, the sharing and acquisition of information, and provide resources for research for both teachers and learners (Richard and Haya, 2009). Course content, regulation, and delivery in addition to learning materials are through internet and other important technologies; this has caused numerous changes in higher education.

In a broader sense, E-learning refers to the use of internet technologies and its applications to improve knowledge and performance (Jethro et al., 2012). According to Markus (2008) e-learning can be defined as a learning process generated by interaction with digitally distributed content, network-based services and tutoring support. E-Learning is “a term covering a wide set of applications and processes, such as Web-based learning,

computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more" (Singh, et al., 2003: 1 cited in Markus, 2008).

In other definitions, e-learning covers more than just delivering fully online-courses. In Oblinger and Hawkins (2005) definition suggest that e-learning has altered from a fully-online course to the use of technology to deliver part or all of a course that is time and space independent. The European Commission (2001 cited in Debande, 2004) describes e-learning a using the new multimedia technologies and the internet to enhance the quality of learning through making ease the access to facilities and services together with distant exchanges and collaboration. Different definitions agreed on that e-learning refers to the use of ICT; including any learning empowered by the use of digital technologies to support and deliver some or all the teaching and learning as well as to enable access to online learning/teaching resources in tertiary education (Arkorful & Abaido, 2014). In this vein, the most e-learning grandiose promises for higher education; worthy of specific note, are the emergence of new learning theories due to the newly electronic technologies which yielded to a revolution in pedagogy. It boasted the potential that learning would be flexible between individuals and groups, self-paced, problem-based, and instructor-led (facilitated e-learning) (Zemsky and Massy, 2004 cited in Arkorful & Abaidoo, 2014).

From the above, one can conclude that e-learning has been viewed differently by many researchers, being a complete on-line course, or being the use of new multimedia technologies for both education delivery and support processes with learning management systems of higher education. In this study, the definition of e-learning by OECD (2005) is used where e-learning refers to the use of Information and Communication Technologies to enhance and support learning in Tertiary education; including web-dependent and web-supplemented or mixed mode for education delivery. This broader definition of e-learning highlights the use of digital technologies and internet with a presiding interest in advanced applications for wholly online, campus-based, or distance education provision.

As e-learning is becoming progressively more prominent in tertiary education, it is actually changing the way universities teach and students learn due to the provided services, cost, quality, and speed. E-learning postulates a new multimedia environment for learning based on electronic networks that permit learners at university to receive

individualised and customizable support. In addition, it facilitates collaborative communication and allows high level of interaction between instructors, teachers, and peers better than in traditional learning environment. It presents several kinds of information and support networks for accessing it irrespective to users' locations and time which in turn makes learning more active, interesting and enjoyable. E-learning offers fascinating experiments especially for students at higher educational levels and encourages them to depend on themselves for the reason that teachers are no more the source of knowledge.

To sum up, Jethro et al. (2005) summarise e-learning advantages in terms of targeting either learning delivery or learning enhancement. Precisely, e-learning aids for learning delivery encompass increased accessibility to information, flexibility in adapting content, personalised instruction, ease of distribution, standardisation of content, and accountability. Accessibility manifests in enabling learners to find what they need when they need. As educational materials are important segment in learning process, adapting and updating content becomes easy with the use of technologies to meet learning objectives. E-learning also standardises course content and delivery instead of repeating the same course to separate sections, in fact this contributes greatly in reducing administrative burden. An additional strength is of assessment's outcomes provision to determine whether learning occurred.

In regard to advantages of learning enhancement, Jethro et al. (2005) also stated that e-learning increases learner interactivity, advances learners' efficiency, motivation, cognitive effectiveness, and flexibility in learning style (p. 205). It is important to mention that the more learners are active participants, the more they become motivated towards and engaged with the content and have the ability to design and regulate their learning. Interactivity offered by the new stronger multimedia stimuli helps to maintain interest in learning, promotes individuals practices and reinforcement. In a nutshell, "evidence suggests that e-learning is more efficient because learners gain knowledge, skills, and attitudes faster than through traditional instructor-led methods. This efficiency is likely to translate into improved motivation and performance" (p. 206).

As e-learning becomes popular for content delivery and instruction, diverse ways of classify the types of e-learning appear. Algahtani (2011, cited in Arkorful & Abaido, 2014)

divided e-learning into two basic types; as computer-based and internet-based e-learning. The former consists of the use of a feasible range of hardware and software which are available for ICT use to be employed in two ways also: computer-managed instruction and computer-assisted learning where the computer is used both for storing and retrieving information to contribute in the management of education and for providing interactive software as a reinforcement means in the class or self-learning support outside it. The latter; internet-based learning, for him, a further enhancement of computer-based learning which internets makes content and knowledge on hand at any time without or with the presence of the instructor (Arkorful & Abaido, 2014). Furthermore, Anderson (2008) pointed that "e-learning technologies can be very effective at facilitating this kind of environment because they effectively facilitate a learner-centred environment" (p. 104).

This feature of online mode learning enabled by internet is described as "synchronous" and "asynchronous". Synchronous delivery refers to real-time, instructor-led e-learning which means that learners can discuss and communicate with the teachers and among themselves through the internet at the same time with the use of videoconferencing, chat forums, instant messages (Jethro et al., 2005). The transformation and receipt of information occurs simultaneously. On the other hand, asynchronous mode of delivery allows learners to communicate teachers or instructors and between themselves by means of internet at different times through the use of emails, online bulletin boards, newsgroups, or weblogs (Arkorful & Abaido, 2014). Information exchange does not occur simultaneously. The combination of all the types of e-learning suggests that learning occurs in different mode.

2.5.1.1. Educational Technology Resources and Tools

Learning and teaching materials are no more exclusively printed ones, however, an avalanche of online materials and resources are available for course content, design and other educational practices. For example, knowledge is acquired through teleconferencing classrooms, video clips, audio sounds, visual presentation and so on. Based on ICT, teachers and learners can interact simultaneously with ease and convenience (Shan Fu, 2013). The early use of ICT in language learning was with the embodiment of computers, language labs were incipiently shaped for listening practices; moving to activities based on

email, mobile telephone ,World Wide Web (WWW), blogs, wikis, online social networking and other interactive WWW sites and services.

In terms of precision, innovative, creative, and active instructional strategies and materials have become extremely important. Many teachers opt for and fuss over integrating ICT in teaching and learning. Obviously, curriculum, pedagogy, assessment, and teaching materials have to be updated to fit the new vision of education. In this regard, developed and developing countries have been specifying large financials amounts on improving ICT infrastructures (Aydın & Gürol, 2019).

Accordingly, the contemporary pedagogical philosophy attempts to alienate the physical spaces of school districts or rather every educational sphere. "Adequate physical and technological infrastructures are necessary conditions for effective ICT integration" (UNESCO 2009, p. 10). In this regard, Modern learning classrooms contains three key elements: connected devices (such as notebooks, tablets or even smartphones); audiovisual tools (including projectors and touch-screen displays); and purposeful furniture that allows students to learn in different ways at different times (such as standing desks, collaborative workstations and connected seating) (UNESCO 2009). Over the last few decades, the incredibility in today's classroom equipments growth has made it totally different from the traditional one. It is becoming increasingly clear that e-learning characteristics, modes and materials are created to overcome issues of time and distance, educational shortages, renovate teaching and learning resulting in computer or internet-generated environments including distributed learning, online distance-learning as well as hybrid learning.

2.5.2. Distance Learning

Aladwan et al. (2019) defined distance education or learning as a "form of education in which students don't need physically attend the place of study" (p. 192). Equally, Honeyman and Miller (1993) described distance learning as "a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both" (p.68). The United States Distance Learning Association defined distance learning in 1998 (King et al., 2001 cited in Aladwan et al. 2019) as "the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance" (p. 5). More

recently, the term distance learning evolves to represent approaches that spotlight on opening access to education and training to reduce the restrains of time and space as well as to put forward flexible learning opportunities to individual and group learners by use of technological resources, computing and internet-based technologies (Bušelić, 2012). It is noticed that these definitions share many common aspects that learning takes place in a situation where teachers and learners or learners themselves are separated and involves the implementation of information and communication technologies and their applications.

On the basis of these definitions, a large and growing body of literature has investigated the usefulness of an online course and incorporation of web applications in order to advance the distance learning environment by directing much attention towards several aspects of distance learning; including its technologies, methods and pedagogy in addition to students', teachers' and academicians' perceptions, attitudes, and opinions. For example, Isik et al., (2010) conducted a study to analyse postgraduate students' attitudes towards web-based distance learning where results showed a positive attitudes among students towards distance learning. In 2003 Beyth Marom et al. (cited in Bušelić, 2012) examined the factors underpinning students' choice of internet-assisted opposed to traditional distance learning.

The obtained data revealed several lines of evidence about the effectiveness of distance learning in the contemporary world. A major benefit of distance learning is its convenience and flexibility due to technologies' easy accessibility, instructors or students have the opportunity to involve themselves in learning whenever and wherever they wish. Distance learning is multi-sensory which enables students meet their needs and preferences. A diversity of materials allows learners to learn from visual stimuli, listening or interacting with a computer program. M any forms of distance learning provide introverted and shy learners with opportunities to interact with via email or other individualised means (Franklin et al., 1996 cited in Bušelić, 2012).

Another benefit of distance learning for learners is offering increased interaction among students-instructors or students-students, i.e., the ability to do teamwork in interactive groups. As well as, it amplifies communication with experts all over the world and who are from various backgrounds (Aladwan, 2019). As distance learning facilitates access to online experts, it presents a large range of online data. Instead of wasting time doing a research through card catalogues or library holdings, learners can utilise online search

engines to find endless research papers, information, and research database to get the work done quickly (Altbach et al., 2009).

Of course, distance learning is not without disadvantages. Bušelić (2012) reported that the most common issue about it is the lack of immediate feedback; unlike traditional classroom setting where instructors can assess learners immediately through questions or informal testing. With distance learning, teachers have to devote a great time to support learners and preparation. Compared to physical classrooms, distance learning does not always put forward the needed coursework online for every degree program. Oral communication skills receive scant or no attention in distance learning and verbal interaction can be missing among teachers and students which allow learners to feel isolated and miss the social-physical interaction (Aladwan, 2019; Bušelić, 2012). In other words distance learning "offers limited direct exchange of experiences that provides the teacher-student and student-student relationship, possible delays in feedback and rectification of possible errors" (Aladwan, 2019, p. 193). Therefore, distance learning requires an advance planning and positive teachers' and students' attitudes with perceive usefulness towards it in addition to their preparedness. Reducing such inconveniences, blending distance learning with physical learning can come up with positive outcomes.

2.5.3. Blended Learning

Technology-driven component of blended learning intersects with many areas of e-learning or distance learning. Yet, it is a field worthy of research of its own. Many forms of blended learning involve the combination of traditional face-to-face classroom instruction with online digital learning (Castro, 2019). Both traditional and online modes of teaching and learning process have merits and demerits, different needs, demands, and expectations. To bridge that gap, a hybrid educational system is needed as a solution based on an integrated approach, such system incorporates the main features of face-to-face classroom instruction with ICT supported teaching and blends the advantages of both modes for catering today's requests i.e., Blended learning (Lalima & Lata Dangwal, 2017). Osguthorpe and Graham 2003 stated that:

> Those who use blended approaches base their pedagogy on the assumption that there are inherent benefits in face-to-face interaction (both among learners and between learner and instructor) as well as the understanding

> that there are some inherent advantages to using online methods in their teaching. Thus the aim of those using blended learning approaches is to find a harmonious balance between online access to knowledge and face-to-face human interaction. (p. 228).

Bryan and Volchenkova (2016) gave a critical overview about the existing blended learning definitions and models. For instance, they noted that the term "blended learning" used as early as 1999. Citing Procter's definition in 2003, blended learning is regarded as "effective combination of different modes of delivery, models of teaching and styles of learning". Again, citing Chew, Jones and Turner (2008) "blended learning involves the combination of two fields of concern: education and educational technology" (p.24). Most influential early definition Bryan and Volchenkova mentioned was that of Graham (2006) who suggested that "Blended learning systems combine face-to-face instruction with computer-mediated instruction" (p.25). They also pointed that similar to Graham, Friesen (2012) proposed the necessity to redefine the term 'face-to-face' as 'co-present', as he suggested that "Blended learning designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students" (p.25).

Adding to this, internet, digital media or computer technology as part of blended learning, does not necessarily mean that learning takes place in another location to face-to-face teaching according to learners' own time. However, it can include working individually or in groups with educational software on computers either in the classroom setting itself or in separate educational labs (Hockly, 2018).

These definitions show that technology as a complex component operating in a diverse set of educational settings and the ways it is used drives a varied range of transformational processes and modalities which are progressively being embedded in higher education institutions as new paradigms of technological, pedagogical, and organisational innovation in universities (Dziuban et al., 2018). In this scenario, the term blended learning has been largely used in English language teaching (EFL) since at least 2007 coinciding with Sharma and Barrett published work called teachers' resource book (Hockly, 2018).

Blended learning consists of a diverse of modes. Staker and Horn (2012) exemplified a most influential approach. They classified four types of modes ranged from original six. As

demonstrated in the figure below they kept these given models: 1) the rotation model, in which students rotate between learning online and other classroom-based modalities; 2) Flex model, in which students could be supervised by the teacher to receive face-to-face support and mainly study online in correspondence to an individually arranged schedule; 3) Self-Blend model, in which students supplement and enhance their traditional studies by taking extra online courses and individual research; 4) Enriched-Virtual model, in which learning occurs mostly online with scarce face-to-face tuition.

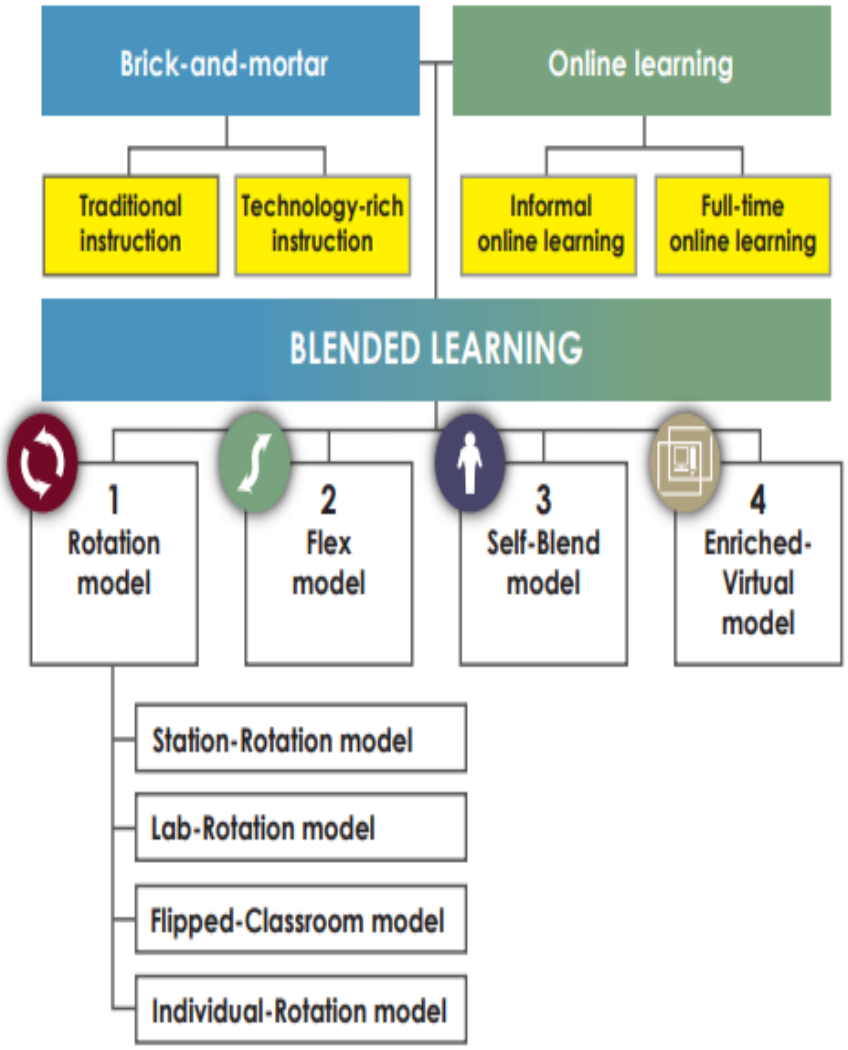


Figure.2. 1.Blended Learning Taxonomy (Adopted from Staker & Horn, 2012)

In Graham's (2006 cited in Staker & Horn, 2012) classification of blended learning models, he categorised them according to four dimensions, four levels, and four types. The four dimensions covered space (face-to-face/virtual), time (synchronous/asynchronous),

sensual richness (high, all senses/low, text only) and humanness (high human, no machine/low human, high machine). His considerations of the four levels encompass: activity, course, program, and institution. For instance, blended methods implemented for individual activities are different from blended learning as an institution-wide approach. Regarding type, Graham classified three categories of blends in terms of purpose: a) Enabling blends, which spot light on access and flexibility; b) enhancing blends, which look for supplementing traditional pedagogy; c) transformative blends, which intended at changing pedagogy (Bryan & Volchenkova, 2016). Overall, the presented models of blended learning clearly demonstrate that the implementation of blended learning approach is demanding with multiple interpretations and considerations, therefore, for teachers and practitioners, it is paramount to not just understand blended learning terminologies, but understanding what learning opportunities would this mode of learning provide for learners, how it would –crucially- improve and support learning outcomes, and in what ways it would be better used and implemented and how successfully challenges of employing it can be met.

Many forms of blended learning provide instructors and learners the opportunity to participate in tow learning modes with other multiple advantages. As Lalima and Lata Dangwal (2017, p. 131-132) described that in blended learning:

- ✓ Students have the option of two modes-They have the possibility to flip from offline to online mode. They can get synchronous communication with teachers, classmates or rotate to ICT supported teaching. This depends on the nature of the course content and objectives. In fact this rotation provides ample time for teachers and students to get creative and cooperative exercises.
- ✓ Teachers are well versed with both the modes-Teachers will develop their flexibility and competency in using traditional methods and digital technologies so that they become very dynamic, techno savvy and highly trained to function expediently in both instructional formats.
- ✓ Students get face-to-face as well as virtual interaction-Both modes allow students to interact with each other in and out the classroom which facilitate peer interaction and group discussion and exchange of ideas. Engaging in virtual discussion and CAI make students gain many advantages without losing social interaction aspect and human touch of face-to-face teaching.

- ✓ Students and teachers undertake full experience in using new technology and undergo different skills-Both become techno savvy and gain enhanced digital fluency. Blended learning facilitates access to e-libraries with virtual laboratories, learning everywhere at anytime through attendance of virtual classroom (video conferencing, blogs), and viewing expert lectures on YouTube and Webinars.
- ✓ Enriched and up-dated course content-Students get interaction with and wide exposure to new perspectives of course content due to knowledge availability on internet or experience.
- ✓ Blended learning provides multicultural and multi dimension approach to teaching/learning process-Discussion and communication stimulates more new ideas and perspectives
- ✓ It is students-centred approach and postulate diverse role of teachers- Students can develop their own learning strategies and rely on themselves to construct knowledge rather than just consuming it. Also, It strengthens professionalism, self-motivation, and responsibility taking

Taken together, this mode of learning, inevitably, has many disadvantages. However, this is by no means something to be deplored. Yet, it is quite affordable. Blended learning enhances a multitude of social skills such as cooperation, expression of idea and opinions, discussion, and interaction. It incorporates "direct instruction, indirect instruction, collaborative teaching, and computer individualised computer assisted learning" (Lalima & Lata Dangwal, 2017, p.131). Therefore, through e-learning, distance education, and blended learning, many characteristics of virtual collaboration must be considered.

2.5.4. Virtual Collaboration and Virtual Collaborative Learning (VCL)

As E-learning and Blended learning are increasingly becoming significant educational paradigms in higher education, Virtual Collaboration continues to attract ample attention and as Collaborative Learning (VCL) in education. The various attributes of online learning such as many-to-many communication and time independence contribute in smoothing the progress of educational collaboration, the improvement of students' thinking as a whole and help a lot in discovering the potentials of online systems (Harasim et al., 1996). Hample (2009) reports that these systems which are mainly due to the

development of web 2.0 tools and turn to be extensively used among a great part of the general population than by a small elite, they become ubiquitous and facile to access rather than being multimodal and diverse only. Respectively, audio and video conferencing, virtual worlds, wikis or blogs are the tools that teachers harness to create collaborative learning environment and promote interaction among their students. Nonetheless, endow their students with a platform to interchange with peers and reflect on their work, forward their strategies and autonomy in learning.

There is a comprehensive body of literature that elucidates the importance of VCL and in learning new literacies thus Computer-Supported Collaborative Learning (CSCL) has been emerged as a new area of research with its *own international journal of CSCL* (Hample, 2009). He states again that in spite of the fact that collaboration and interaction have been recognized as the most distinctive elements in second language acquisition and with regard to the sociocultural approaches to language education, a scant attention directed to the field of language learning.

Much of the literature on Virtual Collaboration takes as its focus 'interaction'. The web postulates interaction in a multitude of modalities. In Anderson's landmark book *The theory and Practice o Online Learning* (2008), he identified that the key components in such interaction are student, teacher, and content that can interact using various net-based synchronous and asynchronous (video, audio, computer conferencing, chats, or virtual worlds). These environments confer collaboration and the learning of social skills together with the improvement of personal relationships among participants.

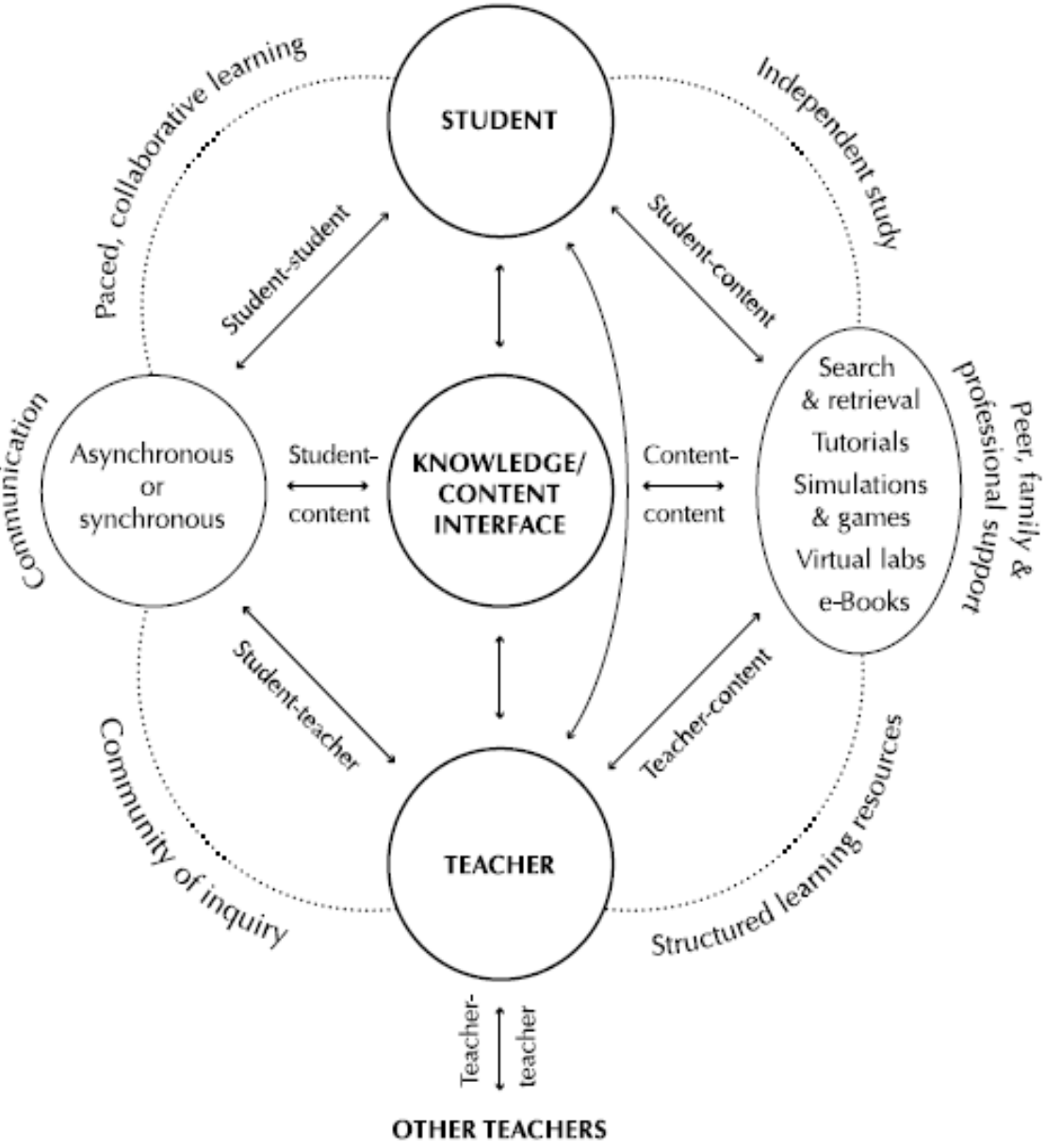


Figure.2. 2.A Model of Online Learning (Adopted from Anderson, 2008)

At the heart of meaningful online learning experience, there is an evidence to suggest that collaboration has an advantage in supporting discussion and reflection and create a sense of community, a higher flow of communication is founded in virtual collaborative learning, compared to face-to-face classroom experience where reflection and dialogue are largely limited due to classroom size and dated pedagogical methods (Anderson, 2008). He states that "the goal of the collaboration is to create a community of inquiry where students are fully engaged in collaboratively constructing meaningful and worthwhile knowledge" (p. 3).

In similar vein of thoughts, Hopkins et al. (2008) assert that in EFL, collaboration and interaction improve learners' sense of community and advanced order of critical inquiry rather than developing their linguistic skills only. Hample (2009) explains that much focus is on the so-called telecommunication that he defines as a scope of research that is specialized and focuses on collaborative activities where learners from several institutions in various communities come along together and that usually are characterized by intercultural perspective, as learners of the same class can work together also. Much further, for him the development of online collaborative CMC tools contributed greatly in facilitating collaborative language learning, consequently, avalanche of research in this field is increasing.

Critical factors; relating to institutional set-up, teachers and students have been heralded as the mainstream central principles for this sort of collaborative learning to be successful in addition to possessing and expanding sufficient individual autonomy along with group autonomy (Hampel, 2009). One of the most cited studies is that of Mangenot and Nissen (2006) who specify the type of this autonomy as the capacity of a group to manage itself at three levels: socioeffective level (getting to deal with others), a sociocognitive level (solving problems collectively) and an organizational level (planning, monitoring and evaluating work).

Mangenot and Nissen (2006) who investigate the value of group learning in network-based language teaching (NBLT), through the lenses of the Vygotskian and Brunerian sociocultural views and in the light of collective activity which allow students to discuss their interpretations of documents, exchange ideas and verify coherence between drafts, they found that collaboration and interactiveness can be as interesting variables to observe, however, an online language course, collaborative settings or a collaborative course design do not assure collaboration and the negotiation of meaning. Hence, Mangenot and Nissen's findings, also, revealed the significance of teachers' involvement to monitor and help learners develop collaborative skills mainly at the sociocognitive level. Another issue was found concerning when and how to interfere to encourage learners interact and collaborate. In regard to, teachers need accompanying information literacy skills to reinforce collaboration and interaction amid learners and, ultimately, the increase of teachers education programs become an unavoidable fact as well as institution need to re-examine

their pedagogical approaches to guarantee the support and help that teachers require to develop the essential skills (Hampel, 2009).

To wrap it all up, building on the above outlined information and explanations of the new digital learning environments and modalities, it seems possible to say that; at the heart of a meaningful educational experience, their process of implementation is not left to chance. “when facilitated effectively by the teacher, this can result in a democratic learning environment for all students” (Anderson, 2008, p. 104).

2.5.5. Teachers’ Roles

The above mentioned changes formulate a wide different world for EFL users and their teachers. The growth of new educational technologies, the change of the nature of education and the emergence of new learning environments support a shared vision for the role of the teacher.

A broader perspective has been explained by Beatty (2010) who argues CALL as an amorphous and unstructured discipline of a constant evolvement of pedagogy and technological advances in hardware and software, notwithstanding, a shift in computer literacy and various illiteracies among teachers and learners. As a result, the “Awareness of this spectrum allows learners, teachers, and researchers to recognize appropriate materials and methodologies and adapt others to various teaching and learning styles” (Beatty, 2010, p. 7). This is an alarm of teachers to be aware of the different ways in which ICT is employed and selected in face-to face classroom or virtual environment because the educational potentialities of the telematic networks are maximised only when these latter are accompanied with appropriate pedagogical measures (Wake et al., 2007). Transferable skills are brought to existence owing to online applications.

Since the use of technology aims at challenging the traditional way of teaching, obviously, the use of it in EFL; particularly speaking, produces evidence of a move from teacher-centered approach to a more collaborative, interactive, and provoked approach revolves around learners’ needs and future requirements. Equally, the role of the teacher has been changed too within the use of ICT. He ceases to be a protagonist. Fitzpatrick and Davies (2003: 4; cited in Wake et al., 2007) said that:

> ... a 'shift of paradigm' is necessary in teacher/learner roles. Co-operative, collaborative procedures are called for to harness the wide range of possibilities the new media offer. Teachers are called upon to abandon traditional roles and act more as guides and mentors.

All the pedagogical changes promulgated by technology led to the emergence of the ambivalence of functions performed by teachers, both in the classroom and virtual spaces of learning that due to, the notion of roles comes to the fore of researchers' interest. Expressly, s/he becomes a facilitator rather than a transmitter, a guide for learners instead of being the source of knowledge. The teacher's role "is to organize, stimulate, instigate, and evaluate the highly complex process of education, as well as to be a helper, consultant, and/or encourager" (Anderson, 2008, p. 104). He specifies that the ability to design situation, means and opportunities; from multiple sources, to students to make them capable of approaching the knowledge offered, are the main bulk of the issue to teachers' roles.

Recently, the roles that teachers have in ICT-based settings have been studied extensively such as Santandreu (2004, cited in Wake et al., 2007) who identified four main roles that teachers cannot deny:

- The teacher as planner and facilitator of situations and suitable learning contexts
- Developer, adapter and creator of materials and resources
- Assessor, guide and knowledge facilitator
- Evaluator

Later on he further sets up a set of functions to each role and some typical aspects for each function:

ROLE	FUNCTION	ASPECTS
Planners and facilitators of learning	Information Consultant	-Provide basic information about the subject to students. - Search for information materials and resources - Give support to students to access information - Expert use of IT to search and recover information. - Adopt a critical position to analyze and adapt to the

		learning context of communication media.
	Course planners	- Be aware of individual and group traits of students - Diagnose the training needs of students. - Design the curriculum - Select, evaluate and organize the technological media and resources
	Designers of T/L strategies	Prepare didactic strategies - Design learning environments which embody IT. - Use resources and their didactic implications - Integrate IT as elements of the curricular design
	Managers	- Manage the class development - Participate in the educational management of the center
	Life-long training	- Participate in courses to update to the subject, resources and didactic strategies - Keep contact to other professionals to share experiences
	Contact with the educational community	- Keep contact with the school environment
Developer, adapter and creator of materials and resources	Resource facilitator	- Search for and prepare resources and didactic materials - Structure materials - Organize contents
	Developer, adapter and creator of materials and resources	- Designing and developing materials in the curricular framework and in technological environments. - Planning activities for training in virtual environments - Designing and developing electronic materials for training

Consultant, guide and knowledge	Student's motivator	- Awakening the curiosity and interest of students towards the subject. - Motivating the students in the realization of activities encouraging participation and fostering discoveries.

		- Providing support and motivation during the learning process.

	Facilitator of the contents	Carrying out well structured expositions according to the characteristics of pupils. - Presenting an interdisciplinary prospect of the contents - Interacting with the class group, setting forth and arguing different points of view. - Considering the three phases of didactic act: global, analytic (research) and synthetic (recapitulation).
	Assessors in the use of resources	- Advising on the use of technological tools in an effective and efficient way for the search and retrieval of information - Advising the process of the information of the matter in the good use of the computer instruments that they facilitate. - Advising on the use of ICT as media. - Helping in the resolution of small technical problems related with ICT
	Guides in the development of activities	- Keep track of student's developments and guide their learning process - Take diversity into account - Enhance co-operative group learning.
	Group collaborator	Favor problem solving through collaboration - Research on the development new activities using IT
	Tutors and academic supervisors	- Diagnose student's academic needs in training and career development - Help students to select and decide on their future

		- Supervise students and provide constant feed-back to encourage better practices
Evaluators	Evaluators	- Evaluate student's learning - Use IT possibilities to carry out evaluation activities and self-evaluation - Evaluate the teacher's methodology to introduce changes

Figure.2. 3.Roles and functions of the teacher (adopted from Wake et al., 2007)

Precisely, the role of the teacher to develop effective pedagogy using ICTs is most commonly associated with the work of Moseley and Higgins (1999) who conducted a research to examine the teaching of literacy and numeracy using ICT in primary schools in Great Britain. Their investigation focused on improving school methodologies when they made use of an interactive learning and teaching model that specified how both teachers and learners' actions as well as behaviours in a given context directly influenced the learning outcomes, learners' reaction to teachers' actions in the classroom defines what and how they learn. In this model, pedagogy observed as a point of interest that revolves all around teachers' behaviours in the classroom (Mumtaz, 2000).

At a deeper level of comprehension, ICT fits to the learning objectives, learners needs and classrooms practices only when effective teachers' choices about when, how and when not to use ICT become as part of their repertoire of pedagogical approaches. In other words, the way teachers understand ICT and see it as changing to the nature of their subject and a tool or an artefact in their teaching, definitely affect their decisions.

Following from such general discussion of teachers' roles in high-tech era, critical issues are being observed. Some teachers have no use for technology as a pedagogical delivery system or integrate it in their curriculum despite the investments on ICT devices and its infrastructure (Afshari, et al., 2009). Though Ministries of education have developed policies and devoted great efforts for incorporating ICTs in education, the results were not what they hoped for. A great deal of researching studies directed attention towards figuring out ICTs' integration conditioning factors in general.

2.6. Factors Affecting ICT implementation in EFL

When integrating ICT into foreign language learning and teaching, there are many things to mull over. Current developments in the field of education view the integration of ICT as an indispensible parameter. Hence, there is a great deal of research on the successful way of making use of such advanced technologies, at the same time making a continuous investigation of the barriers that hinder ICT infusion (Mumtaz, 2002).

A Jordanian study published in First International Conference on Behavioral and Social Science Research by the Malaysian University on 2012 gave a huge attention to figure out the various constrains that forgo ICTs incorporation where Rababah sheds light on a study conducted in 14 countries by the Organization for Economic Cooperation and Development (OECD), founding that among the barriers EFL teachers confront in incorporating ICTs are; an inconsistent number of computers to students; which could be another factor cause by the area (rural and urban schools), a deficit in maintenance and technical assistance and finally, a lack of computer skills and/or knowledge among teachers. Moreover, Jenson et al. (2002 as cited in Rababah, et al., 2012) classified these barriers as: limited equipment, inadequate skills, minimal support, time constraints and lack of interest or knowledge by teachers.

Ever since, Lee's (1997) early studies which concur with that of Lam (2000), identified a number of obstructions classified into; (a) financial barriers, (b) availability of computer hardware and software, (c) technical and theoretical knowledge, and (d) acceptance of the technology. In similar lines, Ertmer (1999) complied that the factors obstructions which make the integration of ICT impossible; are organizational and pedagogical concerns, technical and logistical issues, and personal problems such as fear.

These factors later have been reduced when many educators, policymakers and practitioners launched many educational reforms aiming at creating active learning environment and ICT-rich EFL classrooms. For example, in 2003 the Jordanian Ministry of Education (JMoE) is one of the countries which undertook these instructional transformations (Rababah, 2012). By the late of 1970s, the educational system in Turkey went for the acceleration the integration of new technologies (Semerci & Aydin, 2018). By 2002, Algeria undertook the same process of alignment. Yet, it seems pivotal to point out that by contrast to traditional technologies, modern technologies are not that much easy to

master or manipulate. Since, technology invaded to a great extent the field of education; teachers find themselves under a tremendous pressure. Those teachers could not keep in alignment with such advancement.

As a matter of fact, teachers attributes (issues) are a crucial factor that pinpoint the integration of ICT in learning. They do not use such tools as a mediator of attaining the instructional endings. Building on the work of Yildirim (2007), Aydin et al. (2016) noted that "most teachers do not use ICT to promote pupils attainment in areas cross the curriculum, but they use computers frequently for preparing handouts and tests" (p.77).

Respectively, teachers' doubts and uncertainty about their performance achievement make them unwilling to invest much time and efforts on trying innovative materials or methodologies (Park, 2003 cited in Chen, 2008). Teachers in the process of innovative adoption can be regarded as change agents' promotion efforts. He (Park) further mentioned other seven variables which regarded as salient anticipators of the level of Web-assisted instruction. These variables comprise: computer experience, subjective norm, self-efficacy, relative advantage, and complexity. At this juncture, it is vital to note that Teachers' attitudes are salient to the integration of ICT in the teaching and learning process. These attitudes deeply affect teachers' decision-making regarding the use of ICT in the classroom.

2.6.1. Teachers' Attitudes towards ICTs: reasons for change (A factor of ICT integration)

ICT integration in EFL has proved to be not a straightforward process to be accomplished by the education system and practitioners. Most of the available literature has identified that students; teachers and institutions' factors are pivotal issues that impact the effectiveness of ICT implementation. Among the factors assigned to teachers include their attitudes whereby influenced by individual differences in regard to teachers' readiness and ICT knowledge together with ICT training and on-going support provided to them to harness such technology and utilise the newly developed skills.

In respect of teachers' adoption of ICT, their beliefs about content and pedagogy, competence, attitude, and time are the factors of great importance than other factors associated with hardware (Farenga & Joyce, 2001; Veen, 1993). Putting it the other way

around, the following question must be asked; how do ICT users' attitudes, beliefs, experiences and knowledge influence the ways in which they experience these ICTs?, and to what extent are they ready to adopt them? The consideration of these questions plays a crucial role in the decision to accept or reject such new technologies.

2.6.1.1 . Attitude's Overview (Definition, Components, Formation)

Liking some things and disliking others is what social psychologists refer to as attitudes; being positive, negative, or neutral. In general terms, attitudes are regarded as a major predictor of people's reactions towards a particular social situation or a given system. Thus, understanding attitude's concept, components, formation, and differences were at the core or social psychology studies and the interest of many researchers. Though over 70 years Allport (1935: 798 cited in Haddock & Maio, 2007) confirmed that the attitude concept is "the most distinctive and indispensible concept... in social psychology", the statement remains valid today.

Allport (1935 cited in Al-Zaidiyeen et al., 2010) defined attitude as "a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related". Fishbein (1967) defined attitude as "a learned predisposition to respond to an object or class of objects in a consistently favorable or unfavorable way". For this research sake, attitude is operationally defined as "Making a decision concerning liking vs. disliking, approving vs. disapproving or favouring vs. disfavouring a particular issue, object or person" (Haddock & Maio, 2007, p. 114). In line with Fishbein and Ajzen's (1975) definition; in their remarkable work; Belief, Attitude, Intention, and Behaviour: An introduction to Theory and Research, said that "an attitudes represents a person's general feeling of favourableness or unfavourableness towards some stimulus object" (p. 216).

Precisely, an attitude "is an individual's disposition to react to a certain degree of favourableness of unfavourableness to an object, behaviour, person, institution, or event- or to any other discriminable aspect of the individual's world", Azjen (1993, p. 41) said. Eagly and Chaiken (1993, p. 1) define an attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour". Inherent in these definitions is the idea that reporting an attitude refers to people's responses to evaluate stimulus objects.

Despite the myriad of attitude's definitions, most contemporary theorists consent that the characteristic attribute to attitude is its evaluative dimension (pro-con, positive-negative) (Azjen, 1993). Haddock and Maio (2016) stated that attitude is an evaluative judgment vis-a-vis the stimulus object. Further, attitude is also generally acknowledged as a hypothetical construct that it is inaccessible by direct observation and must be inferred from measurable reactions to the attitude object (Azjen, 1993, p. 42). In respect of this conceptualization, attitudes differ in two significant ways. On one hand, attitudes vary in valence, i.e., direction, for example attitudes can be positive, negative or neutral. On the other hand, attitudes can be different in terms of strength; how more or less you feel about attitude object.

However, these attitude-relevant responses are not limited to specific kinds. These responses; from which can an attitude be inferred, can be categorised in subgroups. The most popular classification consists of three categories: cognitive, affect, and conation indicators where each has verbal and non-verbal reactions (Allport, 1954; Hilgard, 1980 cited in Azjen, 1993). They described that cognitive indicators of attitudes entail verbal expressions of beliefs or perceptual nonverbal responses; bearing in mind that this category holds both perceptions of and information about an attitude abject. Affective responses comprise verbal expressions of feelings or nonverbal physiological reactions towards an attitude object such as facial expressions or other positive and negative indicators of feelings. Regarding conative responses include verbal expressions of intentions or nonverbal motor responses both manifest in behavioural inclinations, plans, intentions, and commitments together with multiple overt motor acts involving the attitude object (p. 43).

Ajzen (1993) reported that an attitude is a latent variable, and cognitive, affective, and conative responses; verbal or nonverbal, are manifest indicators of that attitude. Variance in attitudinal responses shows that attitude is a multidimensional construct consisting of cognition, affect, and conation, thus each response category is a conceptually distinct component of attitude more than being just a system of classification. To extend this line of reasoning, Rosenberg (1960) offered a widely accepted Hierarchical model of attitudes that serves as a significant reference of most contemporary analyses. This model claims that attitudes are made up of three components which contribute to the formation of attitudes despite the fact that each of these components varies along an evaluative continuum and has very specific verbal and nonverbal response tendencies to an attitude object, attitudes

are thus always inferred from (Rosenberg, 1960). In this model the three components of attitudinal structure are included as a first-order factors, and attitude as a single second-factor (Azjen, 1993). Haddock and Maio (2007) showed a model called the multicomponent model of an attitude postulated by Eagly and Chaiken (1993) as demonstrated schematically in the figure below.

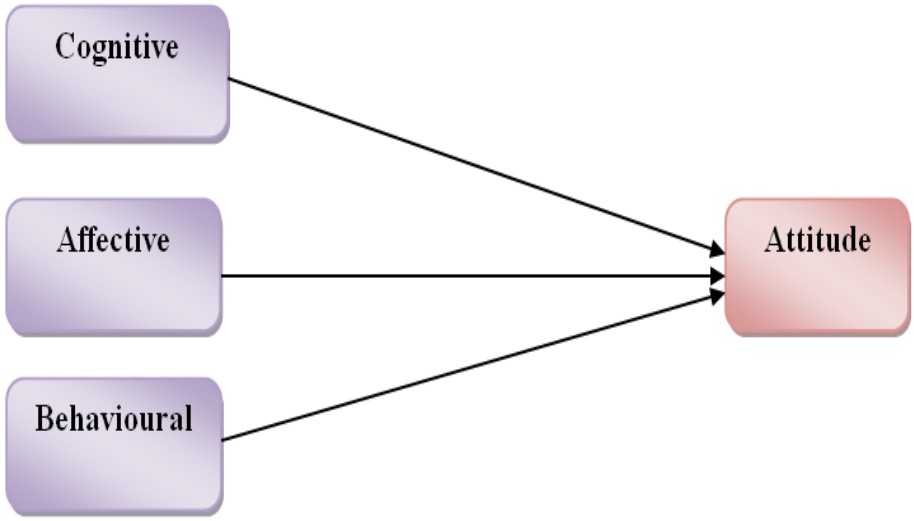


Figure.2. 4.the multicomponent model of attitudes (Haddock & Maio, 2007)

The cognitive component of attitudes refers to "beliefs, thoughts and attributes we associate with a particular object" (Haddock & Maio, 2007, p. 116). They mentioned that Considerations of the positive or negative attributes of an attitude object are key part in forming attitudes. Individuals' beliefs and stereotypes about the attributes possessed by a particular thing or group of people define the how they feel. Attitudes and types of attitudes are strongly associated with cognition.

The affective component of attitudes refers to "Feelings or emotions associated with an attitude object" (Haddock & Maio, 2007, p. 115). Feelings that influence attitudes are generated by affective reactions as an individual's response of exposure to attitude object. Mere or repeated exposure to attitude objects shapes those feelings. The type of affect-arousing stimuli makes individuals like or dislikes the object in question. In addition, the number of times this object is presented explains how much individuals appreciate it. Positive or negative attitudes are strongly associated with positive or negative affective responses during the exposure phase (Haddock & Maio, 2007).

The Behavioural component of attitudes as explained again by Haddock and Maio that this component manifest in responses such as behavioural inclinations and various overt motor acts, as well as it is associated with past behaviours with respect to an attitude object based on the idea that individuals "infer their attitudes on the basis of their previous actions" (p.116). Consistent with Bem's (1972) self-perception theory, past behaviours allow social perceivers to predispose attitudes with respect to the object because these previous behaviours could also influence beliefs or emotional responses (Fabrigar et al., 2005). Additional suggestion indicates that performing a direct physical behaviour by individuals that has an evaluative implications or connotations influences the favourability of attitudes (p.116).

At a general level, the above outlined components are defined independently, yet they correlate and comprise. Responses towards an attitude stimulus can be classified into broader categories and labelled differently; however, they infer to the same evaluative disposition named attitude (Ajzen, 1993).

2.6.1.2 . Attitude Formation

As noted earlier, considering the concept of attitudes continues to draw a critical attention. In this fashion, to understand attitude formation most contemporary social psychologists consider a cognitive or information processing approach which is illustrated by Fishbein and Ajzen (1975) expectancy-value model of attitudes (Ajzen, 1993). Expectancy and value constructs are based on; referring to the first as the beliefs about the object in question and how these expectancies for success function in multiple occasions and the second is referred to as the relative worth of that object of the attitude that is the value (or valence) of an attitude object impacted its significance to the individual (Fishbein & Ajzen, 1975).

In consonance with this model, Fishbein and Ajzen (1975) posit that attitudes develop reasonably from the beliefs individuals hold about the attitude object. Ajzen (1993) reported beliefs are formed about a given object by associating it with certain attributes i.e., with other object, characteristics, or events. Any individual can form many different beliefs about an object but it is only the set of 'salient beliefs' that determines the attitude because those beliefs are readily accessible in memory and impact the attitude at any given time (Ajzen, 2001). In combination, belief's constant accessibility is inclined to improve as

a function of the frequency that serves the activation of the expectancy and the recency of its activation (Higgins, 1996 cited in Ajzen, 2001).

Recently, attitudes started to be referred to more than being just affective or evaluative reactions towards an object; that is to beliefs (cognitions) about the object. These beliefs compile to yield an overall feeling of favourableness or unfavourableness toward the entity in question. To illustrate, any reaction; being cognitive, affective, conative and verbal or nonverbal which reflect positive or negative dispositions towards the object of the attitude can be used to infer to the 'latent attitude'; however, only cognitions are likely to be activated and come to mind spontaneously (Ajzen, 2001). Once the attributes that are likely to be associated with the object in question are already valued positively or negatively, an attitude automatically and spontaneously is acquired. Consistent with this reasoning, people like objects that they believe have desirable characteristics, and they form unfavourable attitudes towards objects associated to undesirable characteristics (Ajzen, 1993).

In this fashion, attitudes are weighted by the sum of evaluations related to each attribute, i.e., subjective value of each attribute. That is, subjective probability of attributes contributes to the attitude toward the object in question in direct proportion to the strength of the belief (Fishbein, 1976). Put simply, Ajzen (1993, p. 45) said that "the strength of each belief is multiplied by the subjective evaluation of the belief's attribute and the resulting products are summed over the salient beliefs" then an attitude is formed.

On a somewhat narrower scale, attitudes present an indication of individuals' responses and inaugurate a predisposition to behave in a consistent manner with respect to that object (Fishbein, 1976). To extend this line of reasoning, attitudes, beliefs, intentions, and behaviours are different variables with distinct determinants, yet they comprise in a very stable and systematic relationship among them (Fishbein, 1976).

2.6.1.3 . Attitude-Behaviour Correspondence

Turning to attitude-behaviour relation multiple factors must be thought of because this relation the relationship of attitudes to behaviours is complex and can be influenced by a set of moderating variables and this relation can be predicted by assessing attitudes and behaviours at comparative levels of generality (Ajzen, 1993).

In a number of publications there have been presented that attitudes cannot predict behaviours, in others they correlated strongly. For instance, Wicker (1969 cited in Frymier & Nadler, 2017) examined the relation of attitudes to behaviours towards blacks and other ethnic groups, jobs, and other issues by reviewing a number of studies. In some studies, he found that attitudes correlated strongly to behaviours and in others low or no correlation. It may reasonably argued that this fracas among findings imply another concern which turned to concern from whether attitudes correlate to behaviours to when they correlate, under what circumstance, and what other factors contribute in such relationship.

Frymier and Nadler (2017) presented five categories of factors have influence on attitude-behaviour relationship: measurement issues, attitude formation, cognitive processing, perceptions of behavioural control, and situational factors. In a thought provocative article, Ajzen and Fishbein (1977) formulated a 'principle of compatibility' or correspondence which stressed that both attitudes and behaviours should be measured by the same level of specificity or assessed at compatible levels of generality. Hence, they identified four factors to be taken into account which permit to be detailed about the given kind of behaviour expected and examined with a specific attitude. These factors are the action performed, the target, the context, and time. Ajzen (1993, p. 47) concludes that:

> Verbal and nonverbal indicators of a given attitude are said to be *compatible* with each other to the extent that their target, action, context, and time elements are assessed at identical levels of generality or specificity...consistency between two indicators of a disposition is a function of the degree to which the indicators are, in this sense, compatible with each other.

In essence, the stronger the statistical relation between attitudes and behaviours is pertained to the level of specificity occurred among the four factors. Taken as a whole, understanding attitudes formation, function, and attitude-behaviour correspondence explains technology adoption. Therefore, many questions are addressed, Why does one individual accept to adopt technology whilst another reject? And how social contexts do influence adoption's decision?

In a constant research appertaining to the reasons of; how one innovation brings a huge change in one society but in another to be abandoned, experts came up with (brought

forth) an assortment of models and developing overlapping theories to explain well the diffusion of innovations. Drawings on that, the diffusion of innovations' theories provide the theoretical frameworks for the current study. Technology use in higher education level is analysed in light of these theories' frameworks. Actually, technology analyses are not only confined to such innovations' theories.

2.7.A Review of Notable Innovation Adoption Theories

As grounded in social psychology, work on attitude and attitude-behaviour relation by Ajzen and Fishbein (1977) has helped to conclude that individuals' attitudes towards a certain innovation are a key constituent in its diffusion. Based on this assumption, many theories endeavoured to explain the relationship of people's attitudes to their actions, behaviours, and decisions of adoption.

2.7.1. Theory of Planned Behaviour (TPB)

Theory of planned behaviour (TPB); elaborated by Icek Ajzen, embraces the principle of compatibility and demystifies that the prediction and explanation of behavioural dispositions require a set of variables. It contends that individuals' behaviour is determined by their intention (the belief that the behaviour will lead to the intended outcome) to perform the behaviour with respect that this intention, in turn, a predictor and a function of their attitudes towards a behaviour. Intentions are supposed to denote the motivational factors that the behaviour is subject to, they dispose the extent to which people are willing to try and how much efforts they devote to perform a given behaviour (Ajzen, 1993). This theory is an extension of Ajzen and fishbein's (1975) Reasoned Action theory (RAT). Reasoned Action theory is a theory that from which TPB is extended which posits that intention is the predictor of people's behaviour which, in turn, predicted by three elements: Attitudes, perceived behavioural control, and subjective norms (Ajzen & Fishbein, 1975)

One well-known work that is often cited in research on attitudes' theory and attitude-behaviour relation is that of Ajzen (1993), in which he explained that the TPB maintains three conceptually independent determinants of intention to engage in a behaviour at a given time and place. The first is the attitude toward the behaviour that is subject to the degree to which a person has favourable or unfavourable evaluative disposition of the behaviour in question. The second is the social factor labelled as subjective norm that

refers to the belief about whether most people approve or disapprove of the behaviour. It is regarded as social pressure to perform or not the behaviour because subjective norms are the personal perceptions of the social pressure which are imposed to adopt a specific behaviour (Ajzen, 1991). The third predictor; which was not part of the RAT, is perceived behavioural control which refers to the perceive ease of difficulty of performing the behaviour that at this level an individual reflects past experiences and predict obstacles and difficulties. In line with this fashion, attitudes reciprocally affect and affected by subjective norms, perceived behavioural control which predispose intentions that lead an individual to perform a given behaviour.

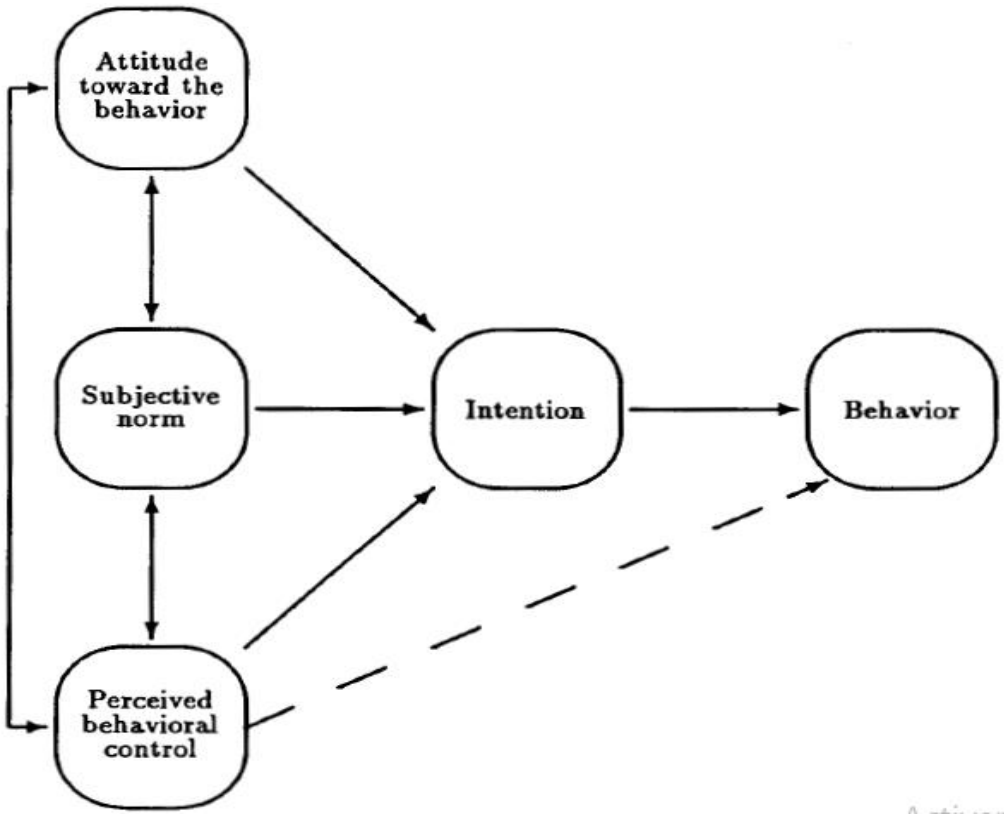


Figure.2. 5.The Theory of Planned Behaviour (Adopted from Ajzen, 1991)

However, this theory displays a perceived rather than actual behaviour control and in various situations this cannot be realistic. Therefore, nonmotivational factors such as opportunities and resources were taken into account. Succinctly, Ajzen (1991) in his theory summarised that to understand attitudes, intentions, and actions it is necessary to concern the anticedents of attitudes, subjective norms, and perceived behavioural control. Hence, the basic explanation of this theory postulates that "behaviour is a function of salient

information, or beliefs, relevant to the behaviour" (Ajzen, 1993, p. 49) that manifest in a verbal or nonverbal responses.

2.7.2. Innovation Diffusion Theory IDT

The two key terms in this theory are innovation and diffusion, previous to examining the basic conceptual determinants of this theory, it is necessary to specify what is meant by innovation before going deep to how it is diffused. Being abstract or concrete innovation can be anything new to the population. Rogers (1995, p.11) defined the term innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption" regardless to its benefits or betters. This theory explains how an innovation spreads in a population, how individuals adopt and adapt to, or reject an innovation (Straub, 2009). In Rogers' words, diffusion is a "special form of communication" (p.5) where innovation is disseminated from one individual to another.

Roger's (1962) Innovation Diffusion theory (IDT) has become one of the most referred theories in the scope of understanding how technology infiltrates the field of learning/teaching. Obviously, many studies implemented Rogers' IDT to help scrutinize contemporary language learning practices and arrange for effectual teaching strategies. According to this theory, individual passes through five stages when deciding on the adoption or rejection of a particular innovation: (1) Knowledge, (2) Persuasion, (3) Decision, (4) Implementation, (5) Confirmation; all follow each other in a time ordered sequence.

Rogers (1995) invoked that stage one is related to one's awareness of the innovation which covers his/her understanding of 'what', 'how', and 'why' of the innovation. For him stage tow, is when an individual gets enough knowledge about that innovation's characteristics and attributes and it highly affects the users attitudes. The persuasion stage is followed by decision stage which leads the individual choosing to adopt or reject the target innovation. Stage four of implementation is when the individual acts on his/her decision. Last stage is when the individual reflect on the process of implementation and decision to re-evaluate and confirm his/her choice. In same vein of similarities, attitudes' formation, function, and relation to behaviour have multiple commonalities to these stages of innovation diffusion.

Viewed from the lens of Rogers IDT, the innovation adoption-decision process is pertained to the attributes of the target innovation itself. Rogers determined five main attributes that influences technology acceptance:

- Relative advantage is the perception that this innovation will bring an additional advantage to previous technology (the more perceive to be better, rapidly adopted);
- Compatibility is when this innovation is congruent with the existing knowledge or schema and similar to situation requirements and practices;
- Complexity refers to how easy or difficult to comprehend and use such innovation;
- Trialability refers to the accessibility of an innovation for experimentation before adoption;
- Observability covers how visible outcomes this innovation has. (Rogers, 1993; Straub, 2009)

This theory presents a connection between attitudes and ICT attributes which can be as a mechanism for evaluating and comparing technology implementation and the uptake of ICT by teachers.

2.7.3. Technology-Acceptance Model

Davis's (1989) Technology-Acceptance Model (TAM) has become arguable the most influential model in the studies related to ICT integration. Previous theories contend that any new idea or object can be regarded as an innovation; however, this model dealt with the necessity for any organisation to adopt computer-based information and communication technologies, that to create its own type of adoption concepts and environment (Straub, 2009). In the past few decades, several theories were to foresee computer use, still most of them needed a cohesive model that take into account the various factors that influence technology use. TAM surpasses in easy applicability of theory to unveil predispositions to adoption (Davis, 1989).

Ajzen and Fishbein (1975) TPB was chosen as the theoretical foundation upon which TAM was built with a number of adaptations to render to the context of this model where "an individual's behavior is a result of their attitudes about the expectation of a behavior and social norms about a particular behavior" (Ajzen & Fishbein, 1980 cited in Straub, 2009, p. 638) to come to a common conclusion that decisions of adoption and attitudes

infer from individuals' perception toward the technology innovation in question. In his doctoral thesis Davis (1985) proposed that any system usage can be a response predicted by users' motivation that is in turn impacted by external stimulus consists of systems' features and capabilities. Which is further redefined.

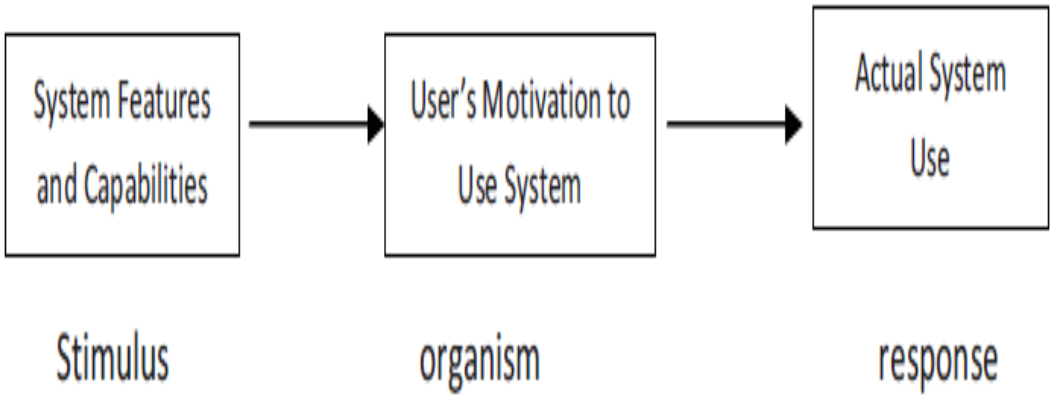


Figure.2. 6. Conceptual model for technology acceptance by Davis (1985) (Adopted from Chuttur, 2009)

Davis's model (1989) posits that individuals' perceptions of a technology innovation influence the actual use of that technology. To expend this line of reasoning, there are two antecedents to predict acceptance or of technology use or usage outcomes among its potential users: Perceived usefulness (PU) and perceived ease of usefulness (PEoU). The first refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). People tend to use or not an innovation according to the extent they believe it would bring them benefits and help them perform well in their jobs or practices. The second is defined as "degree to which a person believes that using a particular system would be free of effort" (p. 320). Usage is theorised to be free of difficulties. Both function as a determinant of behaviour as illustrated in the figure below;

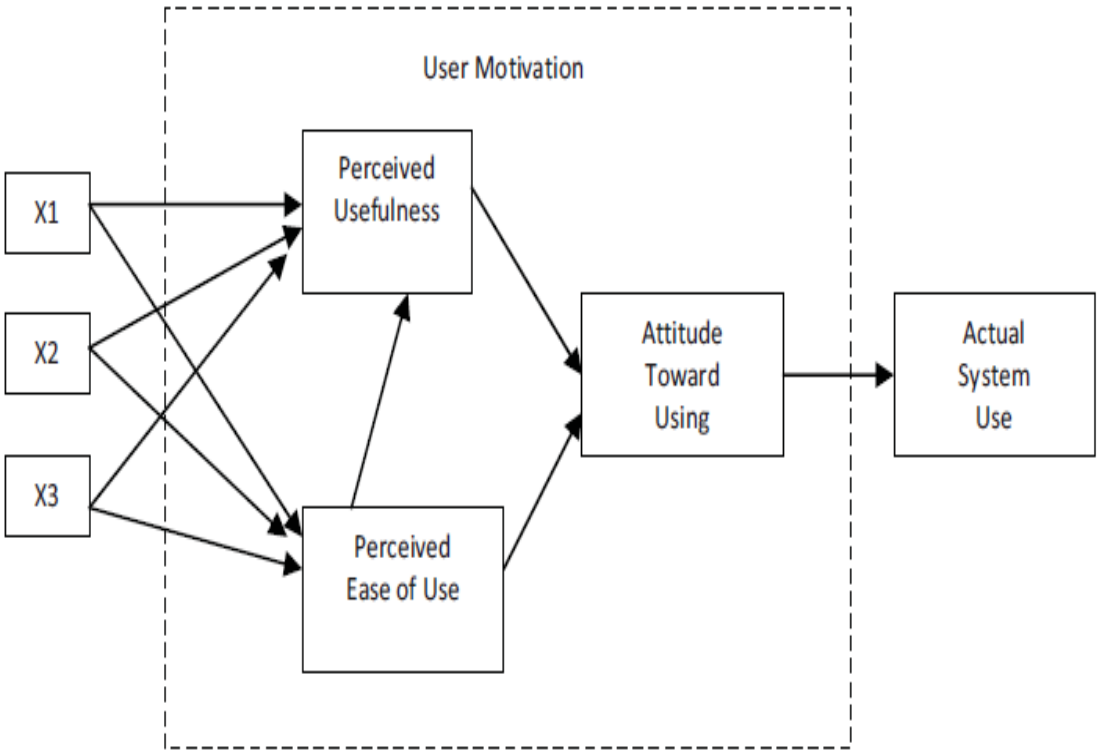


Figure.2. 7.Original TAM proposed by Davis (1989) (Adopted from Chuttur, 2009)

Stated simply, perceived usefulness and perceived ease of usefulness have a significant affect in the prediction of an individual's attitudes toward an attitude object. Attitudes are, in turn, a function of these two major beliefs PU and PEoU. Despite critics on a number of grounds, TAM continues to serve as a useful framework of research and investigation studies related to ICT integration and the factors influencing attitudes to use new technology.

This section described a number of core innovation diffusion and adoption theories to present a clear portrayal of understanding why a person decides to adopt or reject a given innovation. Suffice to note that, the review of these theories postulated conclusions that technology adoption is intricate, socially inherent, and developmental process whereby individuals build perceptions towards technology that affect the process of adoption, thus technology adoption is maintained to address affective, cognitive, and behavioural concerns (Straub, 2009). Finally, concerning basic technology adoption construct of usefulness and people's understanding of technology adoption will contribute greatly to the success of ICT integration.

2.8.EFL Teachers, Digital Literacy, and ICT Training Programs: State-of-the-art (up to date) ENGLISH LANGUAGE TEACHER

ICT training program is a means to an end; improving the competences and literacies of teachers. Upgrading teachers' skills and knowledge is a means to another end; increasing students' achievements and facilitating teaching/ learning process. Technology alone cannot be efficient and learning without it cannot result in satisfactory learning outcomes. So, ICT training and ICT integration must be a systematic enhancement process. Respectively, Burns (2011, p. 5) defines knowledge and skill as:

> "Knowledge is a broad and diffuse term. Often, when we speak of teachers' knowledge, we are referring to multiple domains—their content knowledge, that is, deep knowledge of the subject they teach and their knowledge about learning styles or assessment or instruction. This category is often referred to as "propositional knowledge."
>
> "Skills also fall under the domain of knowledge. Skills include processes, procedures, and strategies that help teachers perform certain tasks. For instance, knowing how to teach hard content in a way that is understandable to learners is a skill. Solving a problem is a skill. Organizing learners in heterogeneous collaborative teams is a skill. Knowing how to facilitate a meaningful discussion among students is a skill. Skills may be considered "procedural knowledge" (Burns, 2011, p. 5).

In the same vein of thoughts, such propositional and procedural knowledge are key determiners of effective teaching and to owe them teachers need constant guidance and modeling, different occasions of practice, structured feedback and reflection as a part of an ongoing improvement cycle (Burns, 2011, p. 5). Discussions about "what kinds of skills and knowing people should have in a knowledge society, what to teach young people and how to do so" (Ilomäki et al., 2016, p. 655) are increasing. The research to date has been designed to determine digital elements of ICT and other digitally-relevant literacies.

2.8.1. ICT and Multiple Literacies

At the heart of a meaningful educational experience, to encounter digital infrastructure, manage digital tools upon digital recourses of any sort, to carry out more-or-less sequential

functions within the context of the task or problem, and make the twenty-first world possible, digital literacy and digital competence have become the central enabling ability. Who understands and comfortably uses e-facilities are those who succeed and empowered in employment, education or any other aspect of life (Martin & Grudziecki, 2006).

In the most inclusive way, the mastery of the available digital technologies becomes a key factor for the realisation of expedient learning environment and enables students and teachers to learn together despite geographical distances. Specifically, generic skills are presented and highly recognised due to outreach and globalisation processes; especially in this e-permeated world. The claim fell to digital literacy and competence as an essential generic skill (Martin & Grudziecki, 2006, Aladwan et al., 2018).

2.8.1.1. Digital Literacy and Digital Competence

In this digital era, various literacies encountered teachers, students and citizens as all. From computer literacy that emerged with the use of computers in 1970s to the more recent literacies where the prefix *e* is preceding different neologisms. The fact of preparing teachers and students to be able to use technology resulted only in limited literacies and numeracy. There was a kind of ambiguity; teachers could not adopt adequate content and devices to make students confident in digitally infused education. Much practice is needed to clarify terms and develop frameworks to make actions run alongside their achievements within the trend of intellectual development (Martin & Grudziecki, 2006). Simply, "eLearning Initiative should address the digital enablement of students and teachers" (p. 153) and the acquisition of digital literacy is significant not only for education but for digitally-infused world as a whole.

The call for developing IT skills; particularly speaking, of teachers gained merit for calling attention of educational researchers to figure out the ways of introducing such digital competences in schools and universities. Over the last years, theoretical analyses are increasing. A set of key competences for lifelong learning released by the European Parliament and the Council in December 2006, outlining a new framework for these literacies. However, such studies remain narrow in promoting ICT competences and developing adequate instruments. Traditional frameworks need to be redefined in more complex way to encompass different technology competencies and ICT-related skills (Calvani et al., 2008).

In recent years, there have been increasing bodies of literature and reports on the expediency of using ICT and the infusion of technology that led to the birth of the concepts of Digital Literacy and Digital Competence which are gaining great fame and recognition on the international level. Educationally speaking, digital literacy and competence enable and facilitate participation in instructional settings. Defining elements and developing frameworks for use received great account.

> The ability to use ICT and the Internet becomes a new form of literacy – "digital literacy". Digital literacy is fast becoming a prerequisite for creativity, innovation and entrepreneurship and without it citizens can neither participate fully in society nor acquire the skills and knowledge necessary to live in the 21st century.
>
> (European Commission, 2006)

The term digital literacy was first used and defined by Glister (1997) as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). In span of ten years, definitions multiplied and Glister's definition is recognised as the "know-how" in multiple researches (Goodfellow, 2011; Gourlay et al., 2013). Digital Competence; in The European framework of key competences for all citizens, is one of eight competences and defined as follow:

> Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet.
>
> (European Commission, 2006, p. 16)

Definitions of digital literacy and digital competence are numerous. Trying to understand the meaning of each concept, a review of the existing published literature is based on as evidence. The researcher will first discuss the definitions and use of the concepts separately to finally discuss how to develop teachers' abilities to use ICT and their implications for higher education.

In his innovative work; A European framework for digital literacy, Martin (2006) proposed a DigEuLi project for the promotion of digital literacy in European educational settings. In this paper, he provided, a definition, a set of generic structures and processes, a set of tools which permit educators and trainers to map what constitute digital literacy and allow students to monitor and reflect upon their own development as digitally literate persons. Martin and Grudziecki (2006) indicate that the term digital literacy is a wide concept that comprises of digitally-related activity of different sorts. ICT literacy, technological literacy, Computer/IT literacy, Information Literacy, Media Literacy, Media Education and much more, are a variety of terms that refer to all the literacies related to ICTs which have gained increased relevance with the emergence of new digital environments, and gradually converge under the concept of digital literacy (Calvani et al., 2008).

Overall, formulating a brief definition, Martin and Grudziecki (2006) declare that:

> Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (p.155)

Additionally, several key elements to digital literacy shared and categorised in the European Framework for Digital Literacy described by Martin and Grudziecki (2006, pp. 154-155):

1. Digital literacy encompasses the ability to conduct digital actions in real life situations successfully;
2. Digital literacy depends and diverse according to individual' s life experiences and situations and it continues to develop as they evolve;
3. Digital literacy is not just one mere literacy, however, it is a broader term than ICT literacy that embeds various elements from different lietracies such as information literacy, media literacy and visual literacy;
4. Digital literacy; as a whole, entails acquiring and using knowledge, techniques, attitudes and personal qualities, and will include the ability to plan, execute and

evaluate digital actions in the solution of life tasks, and the ability to reflect on one's own digital literacy development.

The aforementioned elements specify that digital literacy is a broader concept than ICT literacy. To be a fully digitally literate individual, all the four literacies of ICT literacy, information literacy, visual literacy and media literacy need to be deployed in some measures.

In the same vein, Glister (1997) points out two significant points about being a competent user of technologies in e-society:

1. That digital environment has transformed and revolutionised not only information seeking, but also information handling behaviour;
2. Mastering a discriminating view of what is prevalent on internet is more important than some technical skills.

Drawing on this view, digital literacy is about how to access, obtain and contextualise ICTs. The evolution of literacies indicates a shift from skills' and applications' focus towards the recognition of generic cognitive capacities or processes and the development of several meta-skills with a concern of critique and reflection.

Exploring the concepts of digital literacy and digital competence through another lens, Spante et al. (2018) present a systematic review of research where both are used in higher Education research. They provided an overview of previous researches including 107 publications between 1997 and 2017, with 28 addressing digital competence and 79 tackling digital literacy. This overview seeks to clarify and simplify their definitions and comprehension. Specific research publications and definitions are used to define the two concepts in higher education and fulfil the aim of the present research.

Spante et al. (2018) reported that the term digital literacy was first introduced by Gilster (1997) in the late 1990s; as already mentioned. Drawing on his definition, Joosten et al. (2012) defined it as an adaption of "skills to an evocative new medium, [and] our experience of the Internet will be determined by how we master its core competencies" (p. 6). This suggests that digital literacy relates to the functional use of technology and skill adaptation (Gourlay et al., 2013). Beetham and Sharpe (2011) regarded digital literacy as "the functional access, skills and practices necessary to become a confident, agile adopter

of a range of technologies for personal, academic and professional use" (p.1), highlighting the cognitive perspective of it. In more recent publications, digital literacy regarded as the capacity of understanding and using information in diverse format with a focus on critical thinking rather than information and communication technology skills merely (Chan et al., 2017).

Some of other publications reported in Spante et al. (2018) systematic review indicate that the term "digital literacies" comes to the fore as the plural form of the concept which clearly shows the new and multiple social practices. Kajee and Balfour (2011) argue that literacy is seen as a contextualised practice governed by social institutions and circumstances that sustain them. In similar vein, Novakovich (2016) defines digital literacy as a social practice. Therefore, a great number of research articles frame their research by New Literacy Studies (Spante et al., 2018). For example, Machin-Mastromatteo (2012) grouped information literacy, digital literacy and new literacies under one umbrella term "literacies" to be categorised as follow:

> Information literacy is broadly defined as the individual's ability to handle information in general. Digital literacy refers to the ability to handle technological devices (hardware and software). New literacies are a series of new and innovative skills associated with ways of working with online content and social technologies, thus going beyond the concept of digital literacy" (p. 574)

As an extension of digital literacy definition, Roche (2017) emphasises that accessing, critically assessing, using and creating information, managing multiple and diverse digital sources with a critical analysis for engagement with individuals and communities through digital media, is what it is called Critical Digital Literacy (CDL). Capturing the complementary nature of literacy as a cognitive ability and social practice, Stordy (2015) suggests a definition for such digital literacies as "the abilities a person or social group draws upon when interacting with digital technologies to derive or produce meaning, and the social, learning and work-related practices that these abilities are applied to" (p.472). Such critical discussions point at the importance of developing and increasing digital literacy among teachers, students and higher education faculties.

Moving to clarify the meaning of the other concept, Ferrari (2012) delineates digital competence as a;

> set of knowledge, skills, attitudes, strategies and awareness which are required when ICT and digital media are used to perform tasks, resolve problems, communicate, manage information, collaborate, create and share content, and build knowledge in an effective, efficient and adequate way, in a critical, creative, autonomous, flexible, ethical and a sensible form for work, entertainment, participation, learning, socialization, consumption and empowerment. (p. 3)

Along this line, digital competence is regarded as "the teachers' proficiency in using ICT in a professional context with good pedagogical-didactical judgment and his or her awareness of its implications for learning strategies and the digital Building of pupils and students" (Krumsvik, 2011, pp. 44–45). As well as, it is seen as values, beliefs, knowledge, capacity, attitudes to use technology in an adequate way; encompassing internet, computer, multiple programs, that in general permit the research, access, organisation of information for knowledge production and creation of appropriate learning opportunities.

Considering the above definitions, though the relationship is not necessarily simple to determine and map, digital literacy and digital competence have many arisen overlaps. In a number of studies they are used synonymously despite their distinct origins and meanings. In other works they are used to underpin each other. Mengual-Andrés et al. (2016, p. 1) mentions that digital competence is "a means of achieving a degree of literacy suited to present-day society's needs".

Furthermore, the EU framework for digital literacy indicated that there are three stages or levels of engagement for digital literacy (Martin, 2006). *Digital competence* is the foundation of this system; comprising knowledge, understandings, attitudes and skills relating to the digital. It is acquired as appropriate to a specific life situation and come back to it when a new challenge is presented by another life situation. The application of this digital competence in a given profession or domain contexts generates a corpus of *digital usages* specific to an individual, group or organising to be a part of a community's culture then. Besides, users draw on compatible digital competence and expertise particular to a profession or domain too to induce other digital usages which means that each user adds to

this his/her own history and personal/professional development. When these digital usages stimulate pertinent changes and empower creativity with innovation to the professional or knowledge context, digital transformation; the uppermost level of digital literacy, is likely to be achieved and bring changes either at the individual level, group or organisation level.

It has been observed that digital literacy manifests in practice when an individual tries to solve a problem or a task encountered either in study, work, leisure or any aspect of life. At the first stage, digital competence requirements should be determined and acquire it in an obtainable and favoured learning process. Then, he/she can apply this digital competence effectively with the framework of the identified problem or task using different digital tools to search, find and process information to come cross suitable solutions. This digital competence is modelled and shaped by the knowledge and expertise specific to the professional or discipline context. These uses are named as digital usages. It seems possible to say that digital usages are positioned in relation to and generated at the same time by the power relations of discipline and professional community practices.

To wrap it all up, digital literacy is not threshold; it is rather an ongoing and dynamic process. It depends on the needs of the situation and changes as long as these environments change. It is necessary to update the competences needed as technology itself is constantly changing and evolving. Digital literacy can neither decisively measured nor certified with a one-off diploma such as a driver's licence, however, it must be mapped using a personal development profile with the life-situation of the individual (Martin, 2006). "Digital literacy is a condition, not a threshold." (p. 157) and it is "a continuum of skills, beginning with basic operational tasks progressing to more complex critical production and consumption of digital material" (Bancroft, 2016, p. 49).

Besides, a set of mediating processes between digital usages and their contexts were identified and foreseen by Martin (2006, pp. 157-158), which are as follow:

- Statement: state clearly the difficulty to be resolved or the task to be accomplished and the actions required;
- Identification: identify the required digital resources for solving and achieving such problem or task;
- Accession: find and get the recommended digital resources;

- Evaluation: gauge the objectivity, accuracy, reliability and relevance of digital resources;
- Interpretation: comprehend the significance deposited by a digital resource;
- Organisation: regulate and manage the digital resources to make the solution of the problem of the attainment of a task reachable and possible;
- Integration: combine and incorporate the available digital resources together in a relevant way to the given problem or task;
- Analysis: use concepts and models to scrutinize digital resources to permit problem's resolution or task's achievement;
- Synthesise: recombine and re-associate these resources in multiple ways to reach problem's solutions and task's achievement;
- Creation: construct innovative knowledge objects, units of information, media products or other digital outputs which will give a share in solution of the problem or achievement of the task;
- Communication: constantly interact and corporate with others while dealing with that problem or task;
- Dissemination: disseminate the solutions and outputs to relevant others;
- Reflection: Think about the success of the problem-solving or task-achievement process, and reflect upon one's own development as a digitally literate person.

In association with these processes, the framework for digital literacy outlines four key components as an implementation map:

1. The Digital Competence Content Reservoir: As technology and applications centrally change, it is frequently renewed and updated.
2. The Digital Literacy Provision Profile: to make students able to acquire appropriate digital competence and exercises which they can employ in authentic situations whereby gain digital literacy, it is the course leader or the tutor's role to map such provision and design the suitable profile. Once this latter is completed, they know how to deliver such digital competence.
3. The Digital Competence Needs Analysis: permits to assess the progress of students in digital competence elements determined in the requirement profile. It enables students' assessment with regard to the competence elements which are either pre-course requirements of in-course provision. Data gathered from this

analysis helps tutors to identify students' readiness for the course, as it will make students aware of the possessed elements and alert them to recognize the required competence elements.

4. The Digital Literacy Development Profile allows tutors and students to outline their acquirement of digital competence and its application in genuine digital usages. (p. 158)

In terms of measuring digital competence, there are really few instruments and projects which consider all these constituents. In Europe, European Computer Driving License (ECDL) is one of the most renowned projects provided by foundations and private associations for IT skills' certificates. However, the focus on the mastery of specific technical skills and giving scant attention to other lifelong learning competences proves the limits of this instrument (Alfonsi et al., 2006 cited in Calvani et al., 2008).

For this reason, a number of studies and organisations called for the need to develop other digital competence assessment tools to figure out the extent of teachers' mastery of IT skills and literacies. Calvani et al. (2008) designed and implemented Digital Competence Assessment (DCA) which is divided into three sections the first section is based on instant quantitative tests with automatic feedback (Instant DCA); the second one focuses on situated and complex tests (Situated DCA); the last one consists of projective tests (Projective DCA). They point out that the development of these competences entails "a critical understanding of technologies, a cognitive and cultural background, and in particular the ability to select and manage information, along with relational and ethical awareness" (p. 184). Speaking about ICT integration is speaking about ICT assessment, to figure out the issues and the factors that limit the success of its educational integration.

Referring to the previous studies and research when defining or understanding digital literacy and digital competence, it is concluded that the meaning, depth and breadth of the concepts varies between authors but one common point is that they both refer to the ability to use ICT and the capacities needed to develop and manage digital and technology information systems. Digital competence dominates teacher education, economics, language and informatics. Digital literacy mostly used in health and artistic education (Spante et al., 2018). As already mentioned, to address the aim of the current research, the term digital competence is used to refer to teachers' ability in using ICTs.

In an educational context, digital competence remains a significant confront of the new high-tech era. There remain several aspects of this concept about which relatively little is known. It consists of various essential components. Indeed, understanding, defining all its criteria and assessing them are points of great interest to supply the important guidelines for possible and effective development.

Obviously, developing higher education teachers' proficiency in implementing ICT for professional purposes and implications for students' learning becomes an imperative, in addition to numerous cognitive abilities. Seeking frameworks to make proper involvement turned up to seem more significant. Calvani et al. (2008) developed a framework composed of ...

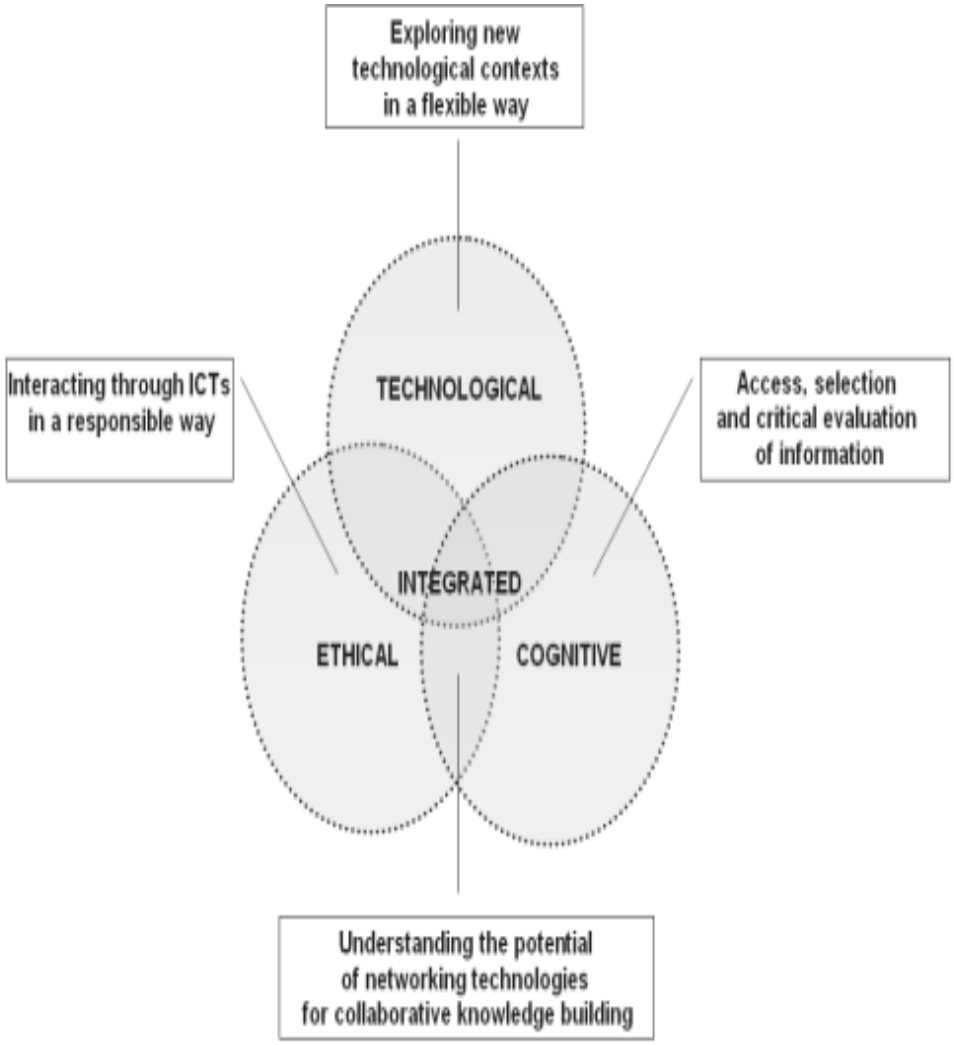


Figure.2. 8. Digital Competence Framework (Adopted from Calvani et al., 2008)

Such frameworks came to enable teachers; a growing generation of digital natives, to engage with reality and determine the uses of digital technology as the servant of educational actions and practices rather than a tool to insulate them from reality. The figure below demonstrates better the competences that any teacher should possess to respond effectively to today's digital world of education.

Such knowledge differs from one teacher to another, there are teachers with little or no experience to use ICT as there are teachers with better ICT knowledge and skills. Hence, training courses should consider such individual differences among teachers to be neither frustrating nor disappointing.

2.8.2. ICT Training (Reasons and Implications)

As already outlined, all professions are influenced by the unceasing advances in information technology which have pushed staff of all sorts of organisations to be computer literate, be able to operate technology- driven equipment and processes, nonetheless, being able to be up- to- date with the constant changes. This in fact had an influence on teachers' training to be the trendy theme in ICT integration in language teaching and learning.

In terms of precision, training becomes inevitable implying the need for existing and new staffs to acquire new knowledge, skills, attitudes and perspectives on a continual basis; just like the need of teachers to respond to the fast innovative and technological changes in timely and flexible way aims to ensure survival and prosper of the teaching/ learning processes (Buckley & Caple, 2007; Chan, 2009). The focal interest in Hampel' s landmark paper Training teachers for the multimedia age: developing teacher expertise to enhance online learner interaction and collaboration, Innovation in Language Learning and Teaching (2009), is to cost light on the skills that language teachers need when teaching online, using digital multimodal tools and the way these skills could be improved through training.

- **What is Training?**

One of the most cited definitions is that of Buckley and Caple (2009), whi defined training as:

> a planned and systematic effort to modify or develop knowledge/skill/ attitude through learning experience, to achieve effective performance in an activity or range of activities. Its purpose, in the work situation, is to enable an individual to acquire abilities in order that he or she can perform adequately a given task or job and realize their potential.
>
> (Buckley and Caple, 2009, p. 9)

Equivalently and early, The Oxford English Dictionary definition of training defines it as a practical education in any profession, art or craft (Garavan, 1997, p. 40). Van Wart et al. (1993 cited in Garavan, 1997) put forward that training is application driven and intends to impart skills that are helpful instantaneously for specific condition. Manpower Services Commission (MSC), U.K (1981, p. 62) delineated training as:

> A planned process to modify attitude, knowledge or skill behaviour through a learning experience to achieve effective performance in any activity or range of activities. Its purpose, in the work situation, is to develop the abilities of the individual and to satisfy current and future manpower needs of the organisation.

Seemingly, Training is an experience that brings a change in behaviour. It is not only about changing actions; however, it is a process that affects ones' cognition and neural functions in an attempt to acquire skills and knowledge as well as develop a kind of expertise to be shared with others.

Respectively, for successful education a kind of training is needed and training, in turn, is paramount for education which both cannot be separated from development for the sake of learning. Yet, an assortment of researchers and Human Resource (HR) specialists a bid to define each term and clarify their implications with elucidating their interconnections, just as Buckley and Caple (2009) stated that lately the concept of learning is witnessing a kind of debate; training and development were perceived as processes occurred in organisations whereas learning; linked to education, was likely to be more formal eventuated in formal settings and be it school, college and university.

To put it another way, the considerable amount of literature which describes the debate related education, training and development in addition to learning shows that these

terms are synonymous to some and distinct to others. Some distinctions have drawn by Reid, Barrington and Brown (2004, cited in Buckley and Caple, 2009). They specified that these distinctions have been found with regard to process, orientation, method, content and the degree of precision involved.

Reid, Barrington and Brown (2004) determined that training is a short term job-oriented and mechanic process that makes use of a systematic and organised procedure to acquire behaviours, facts, ideas, technical knowledge, skills, etc., for a clear-cut objective. Training is generally defined as more holistically as an instructor-led and content-based intervention designated for predetermined changes in behaviour (Sloman, 2005). Furthermore, "Training emphasizes uniform and predictable responses to standard guidance and instruction reinforced by practice and repetition" (Buckley and Caple, 2009, p. 10).

Education, contrarily, is a long term non-job oriented process but much more person-oriented and a series of activities which aim to permit an individual to build up knowledge, skills and values that are not defined to a specific field of activity but allow a broad range of problems to be defined, analysed and solved. It seems to be related more to a formal academic setting. On the other hand, development is an ongoing process that describes the growth and realisation of an individual's ability, through learning (Gansberghe, 2003). It is conscious and unconscious learning processes that intends to expand one's potential and be able to take part within a given organisation in the future (Garavan, 1997).

Shedding light on the available differences among education, training, development and the fourth concept learning, help deeply understand the meaning of each in its special context and comprehend the overlapping relation between them and the ways in which training improve the learning process and attain positive outcomes as whole. In fact, Buckley and Caple (2009) have conclusively shown that despite the pre-mentioned dissimilarities, training, education and development with learning have a reciprocal relationship. They elucidate that the acquisition of knowledge, skills and attitudes in a training environment may directly or indirectly be impacted by prior educational experiences.

Similarly, skills that an individual acquires through training can influence education and used to exploit new learning situations where planned and unplanned experience

cannot be ignored or overlooked. In the same vein of thoughts, Buckley and Caple (2009) reported that training hastens the acquisition of job-related knowledge, skills and attitudes and education develops individuals' intellectual perspectives and tools analysis to act or respond effectively in present and future exigencies.

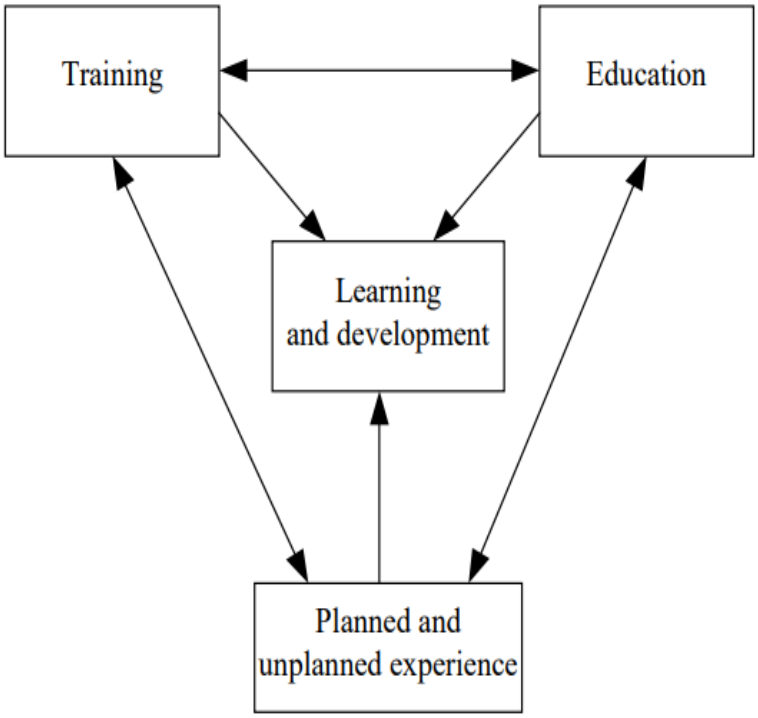


Figure.2. 9.Elements that contribute to learning and development (Buckley and Caple, 2009)

In a similar stratum, Garavan (1997) described the overlap in meanings of the four concepts and the ways in which they could complement one another. From Human Resource Management (HRM) and Development (HRD) perspective, the extent to which HRM/D specialists view these concepts; as synonymous or distinct, considerably impact the way they are managed and approached in any context of profession because in a remote HRM/D subject area, they are viewed as different in nature (Jarvis, 1995; Patterson, 1979 cited in Garavan, 1997*)*. In a holistic view, Garavan brought a significant literature to disentangle (demystify) the meaning of terminology. *Garavan demonstrated how* training for instance, can be associated with 'learning by doing' whereas education is more

synonymous with 'learning by thinking'; development involves learning, thinking, doing and feeling.

- **ICT Training and Professional Development (The Importance and Benefits)**

Apparently, the successful use of technology and training with professional development are highly interrelated in high tech-era. Hence, professional development is a life time process not an event and training has a great contribution in. According to Brito et al. (2005: 70), "Teachers' training has been very often understood as a set of courses which teachers attend more or less actively, being expected great changes to take place, as far as their competences and practices with their students are concerned" and "the professional development of teachers is realised as a process of personal and professional growth as for their competence towards their teaching practices, which is favoured by reflexive processes within collaborative contexts that emerge from their daily practice".

In Learning Along the Way: Professional Development by and for Teachers (2005), Sweeney writes, "Learning is gradual and incremental, and one-shot in-services do not provide teachers with the necessary time or scaffolding to learn" (p, 3) and "Just as good teaching must meet diverse needs in a classroom, effective professional development must meet the individual needs of teachers" (p, 3). As a matter of fact, "Preparing teachers to utilise ICT across the curriculum is paramount to any successful ICT-related initiative" (Abuhmaid, 2011, p. 195). Abuhmaid stated that the training courses; for both pre and in-service teachers, are the chief bolster for tentative teachers who attempt to adopt and utilise ICT, meanwhile, they present new ways of implementing technology for more enthusiastic teachers. Training enables teachers to be real- world individual performer.

Referring to some training's conveniences, Chan (2009, p. 6) in his book; Training Fundamentals: Pfeiffer Essential Guides to Training Basics pointed out that training help individuals and organisations do:

- Develop and retain a leaner but more productive workforce. Preparing fewer groups of individuals to perform specific tasks may lead to great results; developing performances is increasing productivity.

- Keep up with the rapid pace of technological change. The fact that technology is in a constant change, training becomes an ongoing process to help individuals better harness the new software applications or any electronic device; again and again.
- Be more flexible. Training enables individuals to respond efficiently and wisely to the rapid change and be creative and innovative to react properly in unplanned situations and experiences.
- Preparing new employees to their jobs. Initial training; whatever the form it takes helps people to know how to get started.
- Preparing people to take new responsibilities. Training is not only necessary to novice people; however, experts contribute in great success only when they are prepared to undertake new and diverse challenges in their professions.
- Comply with governmental requirements. Ongoing or periodic training helps schools and instructional institutions to meet the government's educational reforms and change.
- Help people manage change. Change can be resisted and considered as a threat to some individuals. This may push them to keep doing things the way they used to despite showing no productivity. As a matter of fact "Training can help people cope with change and provide new information and skills so that they can respond positively to changing situations and needs" (Chan, 2009, p. 8).
- Improve and maintain quality. The ongoing training assures the better results and makes individuals look forward to perform in a way superior to the previous one.

In consonance with the pre-outlined benefits, Truelove (1992, p. 273) puts it together that "Training endeavors to impart knowledge, skills and attitudes necessary to perform job-related tasks. It aims to improve job performance in a direct way". By the same token, Buckley and Caple (2009) demonstrated that the well-planned and effectively conducted training programs present a colossal of potential benefits for individuals and organisations. In a nutshell, the most common outcomes cited in literature conclude that training augments employee skills, knowledge, attitudes, and behaviours (Treven, 2003).

2.9.Conclusion

This section has attempted to provide a considerable summary of the literature relating to the integration of ICT to EFL. In view of all that has been mentioned so far, it is clear that teacher attitude is not only an issue that needs to be investigated profoundly, but it is

an issue that warrants research should figure the factors that impact these attitudes and look for ways to address the challenges teachers face to overcome them.

Chapter Three: Methodology and Field of Investigation

3.1. Introduction

The main purpose of this chapter is to afford a narrative of the methodology embedded in this study. It begins with a description of qualitative and quantitative research approaches as it provide insights to Mixed- Method approach. This chapter also endeavours to throw light on the philosophical underpinnings (theoretical orientations) behind this research design along with a discussion of sample selection. It presents a detailed description of the quantitative and qualitative instruments used for data collection, their steps followed in their design and the strategies implemented to ensure their validity and reliability. A broad explanation of data analysis methods is offered as well as. Overall, this chapter presents procedural diagram of the study's sequence.

3.2. Research Approach

This section portrays the entire relevant data about the subject and procedure of the research, the research tools, and the used materials. Gavora (2000, pp. 10-11) states that there are six stages for conducting a research: the determination of research problem; which has already been mentioned in the introductory chapter, consulting literature, preparation of research method, collection and processing data, interpreting that data, and writing a research report. Therefore, in the practical part, the researcher has to reflect on the design of research methods and the appropriate tools for conducting this research work. A detailed reflection from the broad constructs of a research to the narrow procedures of methods is needed (Creswell, 2014). He stated that; broadly speaking; research approach is the plan or proposal to carry out research which involves the intersection of philosophical assumptions, research designs, and particular methods (p.5). These philosophical worldview assumptions form the foundations of the study that research design is pertained to, to be all put into practice through the selected methods and procedures.

Exceeding on the existing literature about research methodology approaches and designs, Creswell (2014, p. 3) defined research approaches as "plans and procedures for research that span from broad assumptions to detailed methods of data collection, analysis, and interpretation". In Dörnyei's (2007) word; doing a research essentially means finding answers to questions and; in a scientific sense, research is the organised systematic search for answers to the questions we ask. Finding that answers entails following specific

determined ways that according to Creswell (2014) are categorised as the three approaches to research: quantitative, qualitative, and mixed-method.

These approaches at first may appear as distinct. In the most profound sense, quantitative and qualitative approaches are not regarded as discrete or opposites. Instead, they have to be viewed as different ends on a continuum where mixed-methods stand in the middle of such continuum; incorporating elements from both quantitative and qualitative approaches (Dörnyei, 2007; Creswell, 2014).

From one hand, "Quantitative research is the collection and analysis of numerical data to describe, explain, predict, or control phenomena of interest" (Gay et al., 2012, p. 7). Concisely, quantitative approach resides on examining the relationship among variables with regard of testing objective theories. These variables are measured through the use of particular procedures to gather information so that the collected numerical data can be analysed by using statistical procedures (e.g., Excel, SPSS) to be able to report findings and answer the predetermined research questions (Creswell & Creswell, 2018).

On the other hand, "Qualitative research is the collection, analysis, and interpretation of comprehensive narrative and visual (i.e., nonnumerical) data to gain insights into a particular phenomenon of interest" (Gay et al., 2012, p. 7). Concisely, qualitative approach is subject to systematic investigation of the meaning individuals give to a human issue or social phenomena in natural setting; involving data collection procedures that result in open-ended and non-numerical data to be inductively analysed from particular to general and interpreted by the researcher using non-statistical methods (Dörnyei, 2007). Table3.1 provides an overview of the distinguishing feature of the quantitative and qualitative research approaches.

	Quantitative Research	**Qualitative Research**
Type of data collected	Numerical data	Non-numerical narrative and visual data
Research problem	The hypothesis and the research procedures are determined prior to starting the study	research problems and methods undergo evolution as knowledge and comprehension the problem deepens
Manipulation of context	Yes	No
Sample size	Larger	Smaller
Research procedures	Resides on statistical procedures	Depends on the classification and organisation of data into patterns to generate descriptive, narrative synthesis
Participant interaction	Little interaction	Extensive interaction
Underlying belief	We are rooted in a world that is characterised by stability and predictability, and which allows us to accurately measure, understand, and draw generalization about it.	Meaning is situated and shaped by unique perspectives and contexts that are different for individuals and groups, resulting in enumerated meanings within the world.

Table.3. 1.Overview of qualitative and quantitative research characteristics (Adopted from Gay et al., 2012, p. 8)

The above mentioned overview of quantitative and qualitative research approaches demonstrates that each one has particular conceptual steps. Being aware of these research procedures can facilitate the application of the adequate steps to conduct a research depending on the nature of the topic (Gay et al., 2012). Figure.3.1 lists the steps of each approach and the traits that characterise each approach. Furthermore, it provides a detailed

coverage of the full range of research techniques encompassed in quantitative and qualitative research approaches.

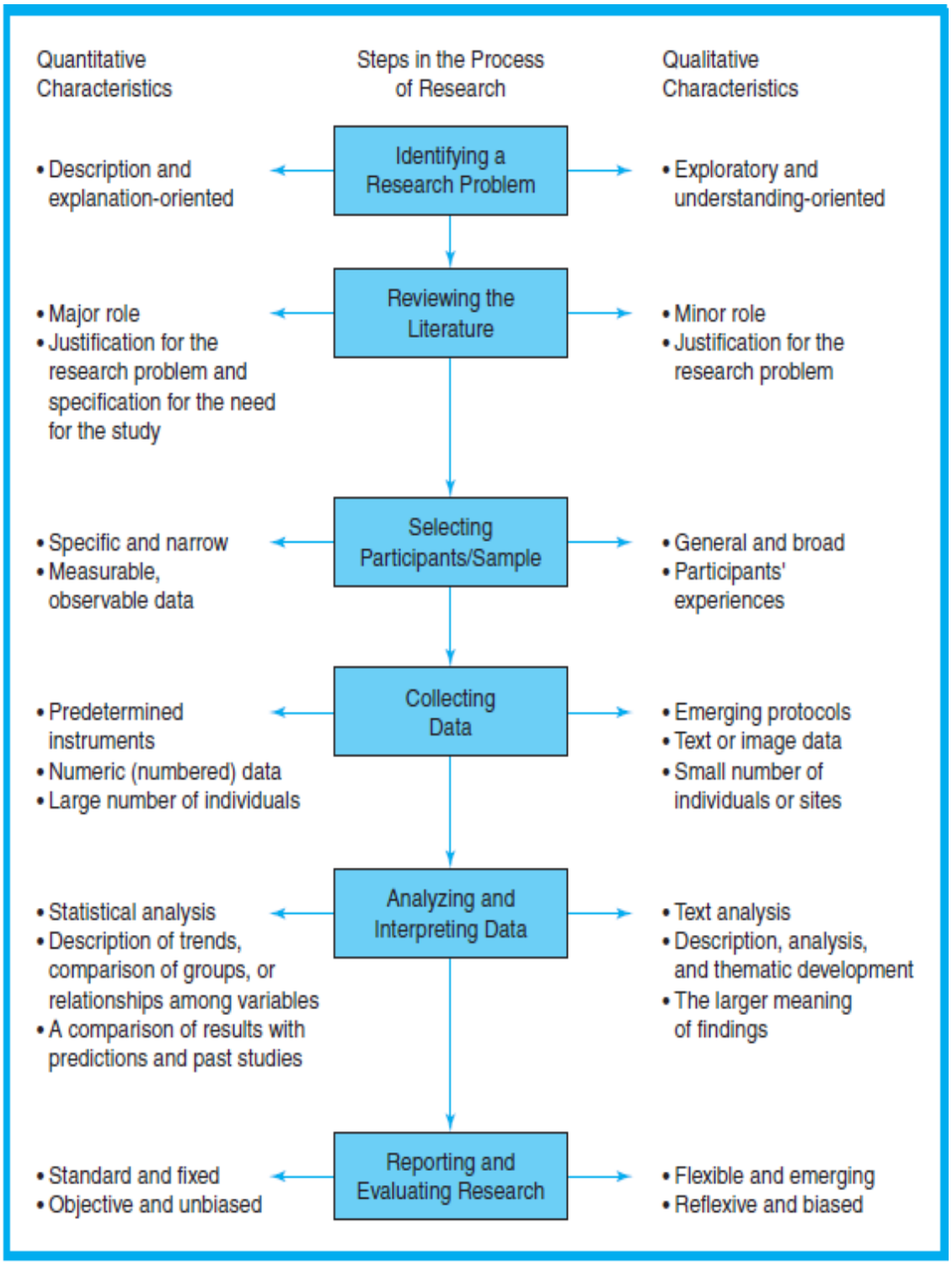


Figure.3. 1. Characteristics of Quantitative and Qualitative Research (Adopted from Gay et al., 2012, p. 15)

The historical evolution of both approaches led to the emergence of the third approach which is mixed-method research. Precisely, from the late of the 19th century to the mid-20th century, quantitative approach was dominating social sciences researches. During le late of the 20th century, an increased interest was directed toward qualitative approach; as a consequence, the mixed-method approach was developed (Creswell & Creswell, 2018). For a given study, quantitative approach seems to be suitable for other is not and vice versa. Unquestionably, the nature of investigation with the needed data determines the appropriate research approach.

3.2.1. Quantitative and Qualitative Research Approaches' Limitations

Inevitably, the steps taken in both quantitative and qualitative research approaches guide researchers in planning, conducting, and interpreting findings. Yet, it is significant to consider the limitations of each. The quantitative approach tends to rigidly follow predefined and structured procedures that often focus on numerical data and statistical analysis; as a result, in-depth comprehension of the contextual factors on the behalf of the observed patterns is missed. Due to this lack of contextual understanding, the phenomenon under investigation may not be examined through quantitative measures only. Especially, when studying and exploring social and behavioural aspects of a given phenomenon, the reality cannot be simplified and reduced to measurable variables.

On the other hand, qualitative research approach's limitations may manifest in the lack of objectivity. Subjectivity and bias are likely to occur in data interpretation especially when the researcher's perspective interferes in the process of analysis. In the same line, the generalisation of findings a larger population can be limited that it may seem difficult to replicate the same study. Moreover, this approach is time's and efforts' consuming than the quantitative approach.

In practice, to overcome the limitations associated with each approach, researchers generally resort to a combination of both quantitative and qualitative approaches in order to examine and understand the problem under study deeply. Putting this in mind, the researcher used mixed-methods approach for the present study. The researcher's main motive was selecting an approach based on a number of criteria that serve the overall character of the research and its feasibility.

3.2.2. Mixed-Methods Approach

Creswell (2014:3) defines mixed-methods approach as "an approach to an inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data and using distinct designs that may involve philosophical assumptions and theoretical frameworks". It emerged from the combination of quantitative and qualitative approaches. According to Gay et al. (2012), mixed methods research is a systematic process of inquiry that entails the collection, integration, and analysis of both quantitative and qualitative data in a particular study to drive inferences and make interpretations that offers better comprehension of the phenomenon under investigation. On a similar vein of thoughts, Creswell and Creswell (2018) stated that the focal assumption of blending the two approaches of research is that an insight understanding of a research problem can be attained than using solely one single approach-A view shared by Johnson et al. (2007). From an analysis of nineteen definitions of research methodologists pioneers, Johnson et al offered a definition to mixed-methods approach of research as:

> Mixed-methods research is the type of research in which a researcher or team of researchers combines elements of qualitative or quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. (p.123)

Taken together, implementing mixed-methods approach permits profound understanding of all dimensions, perspectives, and contextual patterns of the research problem (Dörnyei, 2007; Creswell & Creswell, 2018). Despite the challenges exist with this research approach such as time and effort consuming, Creswell (2014) posits that mixed-methods approach help researchers to: a) compare multiple points of view based on quantitative and qualitative gathered information, b) qualitative data adds in-depth explanation to quantitative results, c) develop appropriate tools to collect and measure quantitative data relying on previously gathered qualitative information, and more. Gay et al. (2012: 486) demonstrate; in their remarkable work entitled *Educational research: Competencies for Analytical Applications,* different designs of mixed-methods approach when incorporating the quantitative and qualitative approaches of research. They are illustrated in figure3.2.

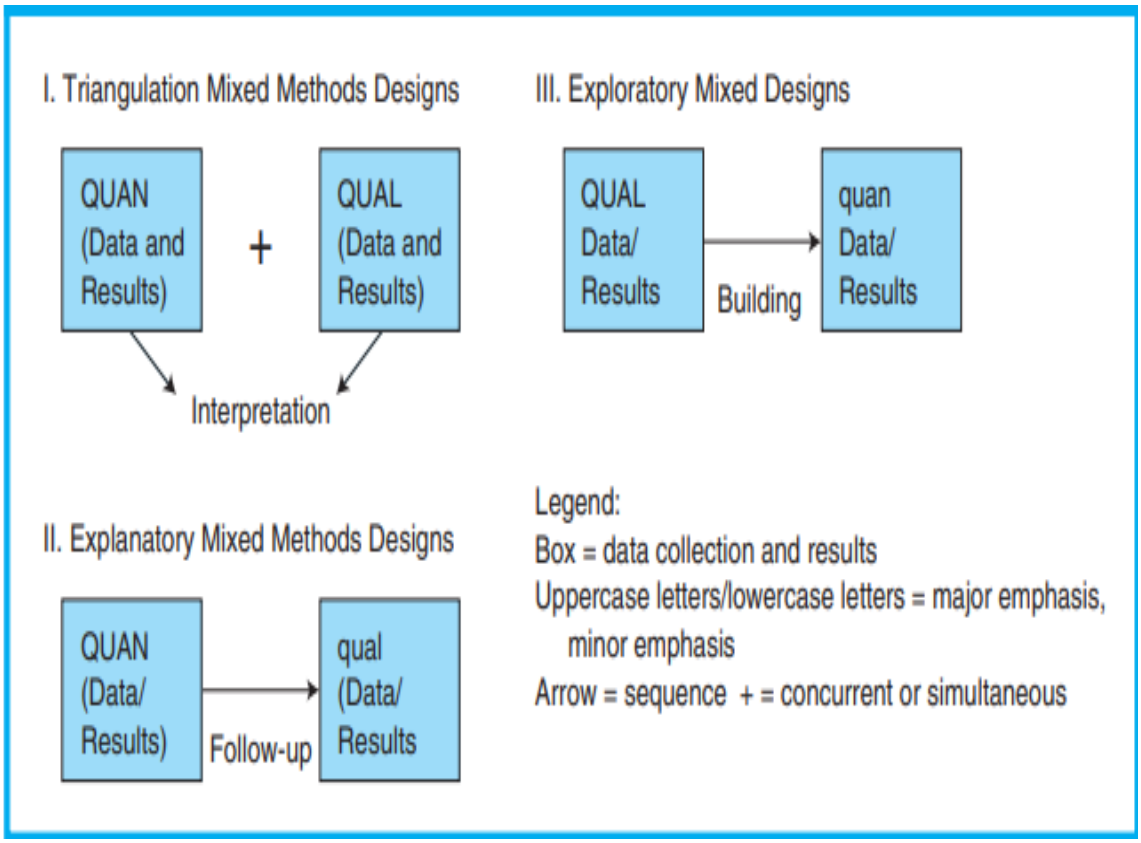


Figure.3. 2.Types of Mixed Methods Designs (Adopted from Gay et al., 2012)

After having a clear overview of the quantitative, qualitative, and mixed-methods approaches of research and investigating their available characteristics to conduct a research, mixed-methods approach has been selected for the current study depending on the nature of the research topic, as well as, to provide a leverage of data resources and a more nuanced analysis. The researcher adopted the view of Gay et al. (2012, p. 483) who strongly posit that though mixed-methods research approach seems to be obvious, "it requires a thorough understanding of both quantitative and qualitative research. In fact, few researchers possess all the knowledge and skills to master the full range of research techniques encompassed in quantitative and qualitative research approaches". Therefore, reasons of research approach selection are better explained in the following section.

3.2.3. Explanation of research approach selection

Appropriate choice of research approach, also, entails considering the approaches used in previous researches in fields and studies of similar nature of research, aims, and objectives. It is noticed that both quantitative and qualitative methodologies and combining

them are used in much of the research about investigating the patterns and the process of ICTs integration into EFL context. This does not mean to follow these researchers and the approaches they have chosen all the time; however, having an idea about what is done before helps the researcher of the present research work to evaluate their merits and demerits and see what works for ones' own study. With these criteria in mind, the mixed-methods research approach was adopted.

Moreover, based on its practicality and feasibility, the current study adopted the mixed-methods research approach where quantitative and qualitative approaches are combined to provide more understanding of the research problem and accurate data from multiple vantage points compared to each approach individually (Creswell, 2014). In concurrence, using a combination of several methods contribute to overcome the weakness of one method by the other methods.

In this respect, in this study the researcher deployed mixed-methods approach to explore the relationship between variables that comprise research questions and hypotheses and, to identify and assess the factors that influence EFL teachers' attitudes towards the integration of ICTs into EFL context at a tertiary level, and to describe these attitudes also. These undertaken research procedures followed by the researcher are better supported by Creswell (2014) view; arguing that developing numerical measures to studying individual behaviours and performances becomes significant in social studies. Also supported by Gay et al. (2012), claiming that "mixed methods can be used to build on the findings of a qualitative study by pursuing a quantitative phase of the research, or vice versa" (p. 483). To corroborate the findings of quantitative methods, the researcher used qualitative methods to reinforce the understanding of quantitative ones. Research tools of these methods will be explained in details in another section below. Furthermore, the researcher sustained Dörnyei's (2007) view; saying that words add meaning to numbers and vice versa. In addition he contends that

> … certain issues are best researched using either QUAL [qualitative] or QUAN [quantitative] methods but I have also come to believe, that in most cases a mixed methods approach can offer additional benefits for the understanding of the phenomenon in question. (p. 47)

It is important to note that approaches have strengths and weaknesses. Hence, they should not be viewed as rigour distinct and incompatible; however, they should overlap. The interaction with quantitative and qualitative research designs ensures a comprehensive understanding of the research topic. It enhances the validity and reliability of the study by examining different aspects of the research topic and help address practical limitations such as time constraints. The need for diverse perspectives from participants and budgets intricacies, enable cross-validating findings and provide a more nuanced analysis (Best & Khan, 1993; Dörnyei's, 2007; Creswell, 2014). Part of the inquirer's decisions to adopt mixed methods research approach, is the influence by the three identified reasons for combining quantitative and qualitative research by Rossman and Wilson (1985 cited in Johnson et al., 2007, p. 115) which are:

- Combinations are used to enable confirmation or corroboration of each other through triangulation;
- Combinations are utilised to facilitate or develop analysis in order to provide rich data;
- Combinations are employed to initiate new modes of thinking by attending to paradoxes emerging from the two data sources (p. 115).

Therefore, both methods are used concurrently to provide valuable insights to the phenomenon under study and reach research questions and purposes.

3.3. Research Variables

As identifying the path and deciding upon how to conduct the research are essential, determining the variables for research are of great significance. Based on the theoretical framework and research purpose, the present study aims first to examine university EFL teachers' attitudes towards the integration of ICTs in EFL, second, to explore the presumed relationship between EFL teachers' attitudes and factors of influence identified as: Perceived Usefulness of ICTs, ICT competence (including Perceived Ease of Usefulness and ICT expertise), Social Influence, ICT Training. This would explain EFL teachers' ICT actual use and their future intention of continuous use for the teaching and learning of EFL as shown in the figure3.3 below:

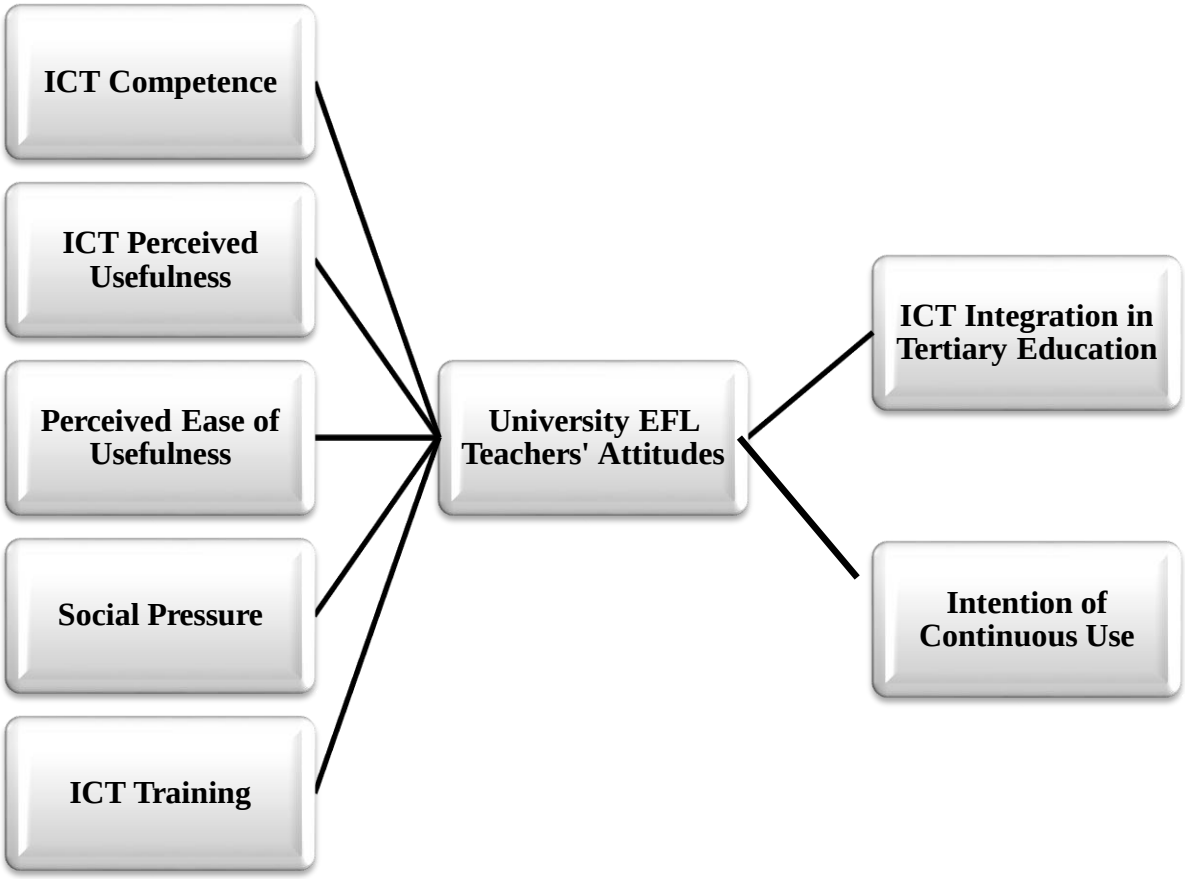


Figure.3. 3.Research variables of the present study

University EFL teachers' attitudes towards the use of ICTs were the dependent variable in this study. ICT competence, Perceived Usefulness, Perceived Ease of Usefulness, Social Pressure, and ICT Training were controlled as the independent variables. These independent variables were determined to explore their contribution to the formation of EFL teachers' attitudes towards the use of ICTs in the teaching and learning of EFL. As well, to describe the relationship that exists between them. In the following lines, the variables are outlined in details;

- ICT Competence can be assumed as the knowledge and capacity that teachers possess to make appropriate use of technology in education and EFL.
- Perceived Usefulness can be regarded as the degree to which EFL teachers believe that the use of ICTs have positive impacts of their performances and help them obtain positive outcomes to their teaching and learning. It can also be conceived as value and performance expectancy.
- Perceived Ease of Usefulness refers to the degree EFL teachers find the use of ICTs easy or difficult. The present study examines the contribution teachers' expectancy of efforts on their attitudes.
- Social Pressure are determined as the subjective norms found in and the demands put on teachers in an educational setting to adopt ICTs; including, faculty policy, students' demands, government's educational reforms and innovations; especially that those technology-based reforms are multifaceted endeavour which needs huge efforts to attain the full pedagogical potentials of ICT which also generates a revival of interest to e-learning incorporation in EFL that affect the relationship between attitudes and action. In addition to, Covid-19 pandemic as a social factor in changing attitudes. Everyone knows that Covid-19 has placed new educational circumstances where there was a total closure of schools and universities. Mehar and Arora (2020) reported that universities and school closure influenced approximately ninety four per cent (94 %) of world's student population; up to 1.6 billion learners in more than 190 countries and all continents. This abrupt lockdown forced many teachers and administrators to adopt many digital tools and develop online courses and exams to keep learners on the track. Both teachers and learners were confronted with new digital learning environments and new learning demands. So Covid-19 as a power of a social situation has an impact on teachers' attitudes in particular and their pedagogical performances in general. Covid-19 can be an enabler of online learning and enhancing ICT integration, tailoring teachers' attitudes as well.
- ICT Training that is regarded as a facilitating factor to provide support and necessary knowledge to technology use for both EFL teachers and Didactic EFL students. ICT training for teachers can be provided by institutions of

university in addition to classroom equipment and technical support. Student teachers' training can be measured by the degree of preparation and the adequate content their teachers offer them to develop these new competencies to be competent future teachers.

3.4. Research Design

After selecting the research approach and identifying the research variables, it is essential to design and prepare the appropriate methods to conduct this research. Mixed-methods approach requires a combination of several methods and implementation of specific systematic ways that enable the carry out the research. In addition, the dominant nature of study should be identified and used as guidance in forming data collection methods.

At the broadest sense, Gay et al. (2012, p. 19) mention that "the more information you have about a study, the easier it'll be to categorise it". In concurrence, Creswell (2014, pp. 11-12) stated that "the researcher not only selects a qualitative, quantitative, or mixed-methods study; the inquirer also decides on the type of study within these three choices". Overall, at this stage, the design process was identified regarding the type of research design and instruments.

As stated, this section contains quantitative and qualitative methods for data collection: survey questionnaire and interview. It offers a deep description of research context and setting. A broad explanation of sampling and sample selection is included with data collection procedures and methods of analysis. The following diagram3.1 illustrates the sequential procedures of the present study; including which research approach the researcher has adopted, how research instruments are developed and distributed, and how data is collected and analysed.

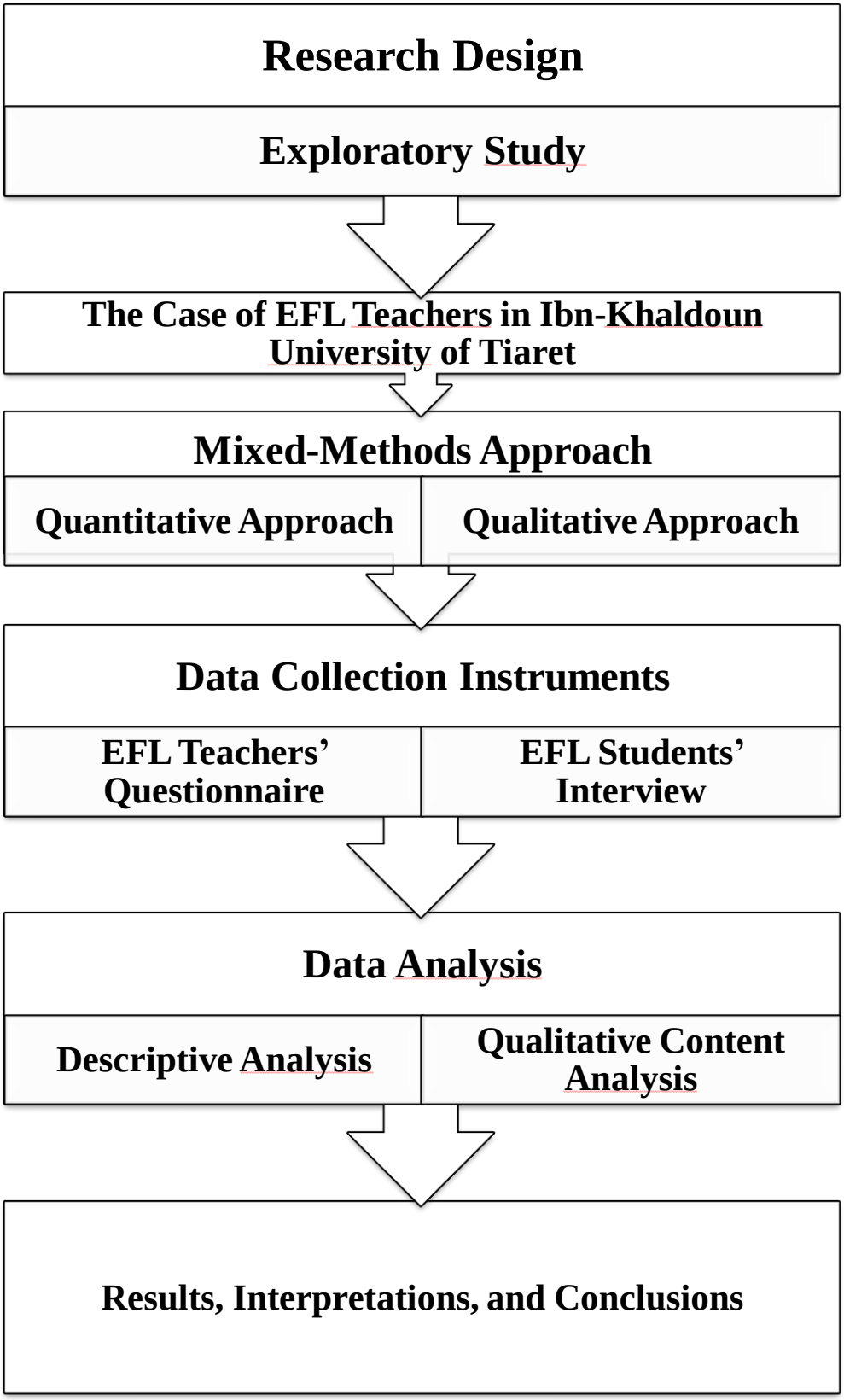


Diagramm.3. 1.The Design of the Study

This study is of exploratory-descriptive nature. It is exploratory for the reason that within the Algerian context of EFL little prior research is found about EFL teachers attitudes towards the use of ICTs. Creswell (2003, p. 30) posits that exploratory studies are found when "not much has been known about the topic or population being studied". More, teachers' attitudes are unknown, diverse, and unanticipated which cannot be captured through predefined set of close-ended questions, hence, the current study intends to explore the diversity and complexity of teachers' attitudes in a flexible way. In similar vein of reasons, these attitudes are influenced by the factors found within the teaching practices context that is an exploratory research can be suitable to uncover and understand those context-specific factors. Additionally, an exploratory study can capture the change of EFL teachers' attitudes due to the rapid evolution and change of ICTs and the dynamicity of their integration into EFL.

Besides, this study is descriptive in nature as well because it intends to describe the relationship exists between EFL teachers' attitudes and the selected factors that can have an influence on ICT integration. Best and Kahn (1993) mention that descriptive study is "concerned with conditions and relationships that exists, opinions that are held, processes that are going on, effects that are evident, or trends that are developing" (p. 105). Descriptive study is mainly concerned with the study of attitudes, opinions, preferences, demographics, practices, and procedures; in which data is collected through the use of questionnaire, interview, or observation (Gay & Airasian, 2000). Creswell (2014) suggests that descriptive study is appropriate when a problem does not reside on controlled inquiry and experimentation. It is known as non-experimental or *correlational* research, seeks to find answers to questions through the analysis of relationships between variables, testing hypotheses, and developing generalisations. Precisely, what factors seem to be associated with particular occurrences, outcomes, conditions, or types of behaviour (Best & Kahn, 1993).

For the sake of clarity, descriptive research methods are "non-experimental, for they deal with the relationships among non-manipulated variables" (Best & Kahn, 1993, p. 120). Best and Kahn illustrate that in this type of research, the researcher selects the relevant variables for an analysis of their relationships from the events or conditions that have already occurred or exist. Respectively, this study has been conducted using an exploratory-descriptive design where the researcher does not manipulate variables or

arrange and regulate events to occur. In effect, they are observed, described, and analysed to get an in depth understanding of the issue or phenomenon being studied, that is if the given variable is associated with the other variable, so that, the gathered results may suggest general explanation of the current phenomenon.

The present research intends to explore, describe, and analyse information about teachers' attitudes and ICT usage, thus, it is of exploratory-descriptive nature. In fact, this justifies the selection of mixed-methods approach and the idea behind identifying the nature of the study where data collection and analysis methods can be easily determined. Elements of both research designs are incorporated to attain a comprehensive understanding of the phenomenon under inquiry. The characteristics of exploratory-descriptive research design in this study are exhibited in the incorporation of questionnaire's use to gather quantitative data about the prevalence of given attitudes via the description of teachers' actual use of ICTs; including open-ended questions within that questionnaire to collect qualitative data to explore the reasons behind these attitudes and experiences of ICTs, in addition to, the use of interviews. As data analysis procedures, calculating frequencies and percentages together with content analysis are used to interpret responses; they are explained in details in the coming lines.

Therefore, in this study, the researcher in order to collect the data on the population of EFL teachers in the English department at Ibn-Khaldoun University of Tiaret; the case of study, first, the researcher used a questionnaire to EFL teachers. Second, the results of quantitative analysis were supplemented by a semi-interview with first year Master's degree EFL students of didactics to cross-check those results and delve into describing teachers' experiences of ICT and underlying the factors affecting teachers' attitudes. To sum up, combining quantitative and qualitative data collection and analysis in a mixed-methods approach, a sequential research design is implemented where quantitative data is collected and analysed then followed by a qualitative data collection to deeply explore and describe the quantitative results. The decision of bringing elements from both designs, allows the researcher in this study to triangulate findings and diversify data resources. The research instruments will be illustrated deeply in one of the following sections.

In this fashion, survey research methods are viewed as efficient data collection means on EFL teachers' population at Ibn-Khaldoun University of Tiaret. Gay et al. (2012, p. 9) rightly point that:

> Survey research determines and reports the way things are; it involves collecting numerical data to test hypotheses or answer questions about the current status of the subject of study. One common type of survey research involves assessing the preferences, attitudes, practices, concerns, or interests of a group of people.

At the procedural level, cross-sectional survey methods were employed using EFL Teachers' Questionnaire (ETQ) to gather information from participants in a single period of time and make generalisation from a sample to a population. Cross-sectional survey is the most common survey form used in educational studies. It seems to be effective as it depicts the characteristics of a population at a given point in time from a selected sample (Cohen et al., 2007). It facilitates collecting data directly from individuals in a systematic standardised manner. In addition to, EFL Students' semi- structured Interview (ESI) is employed too; as already mentioned to cross-check the results, for more in depth information, and ensuring the trustworthiness of the findings. Dörnyei (2007) states that survey data can be gathered by both interviews and questionnaires; in spite of the fact that questionnaires are regarded as the main data collection method.

Despite of the fact that survey research seems to be simple, it encompasses more complexity than just posing questions and reporting answers. Multiple challenges can be encountered and threaten response rate; including respondents' failure to return the questionnaire, their willingness to be surveyed through the phone, or their ability to attend planned interviews, consequently, it is difficult to derive valid and trustworthy interpretations and conclusions (Gay et al., 2012). Therefore, crafting and constructing questions for the targeted respondents necessitates precision, consistency, and clarity.

Research Questions	**Methods**
➢ What are the attitudes of EFL teachers at Ibn-khaldoun University of Tiaret towards the use of ICTs in EFL teaching and learning?	ETQ
➢ To what extent are ICT competence and ICT perceived usefulness likely to impact teachers' attitudes towards ICTs use?	ETQ

➢ To what extent are teachers generating differentiated models of teaching practices through the use of ICTs after Covid-19?	ETQ
➢ How does ICT training influence teachers' ICT use and their Continuing Professional Development (CPD)?	ETQ

Table.3. 2.Research Questions and Data Collection Methods

3.4.2. Population

In general terms, Dörnyei (2007) determines population as the group of people whom the study is about (p. 96). Best and Khan (1993) define a population as "any group of individuals that have one or more characteristics in common that are of interest to the researcher" (p. 13). Population is the entire group of individuals being studied and selected for analysis as well as experiments, and from which the sample is taken. For the most part, "populations may be any size and may cover almost any geographical area"; however, "the chosen population is generally a realistic choice (i.e., the accessible population), not an ideal one (i.e., the target population)" (Gay et al., 2012, p. 130).

Putting these criteria in mind, the researcher has selected EFL teachers with 1st year Master's degree EFL students of didactics in the department of English at Ibn-Khaldoun University- Tiaret as the target population in the present study during the 2022-2023 academic year. EFL teachers were the population of research questionnaire instrument. The total number of EFL teachers was 48. Master's degree EFL students were the population of the interview data collection instrument. The number of master students of year one in didactics was 130.

3.4.3. Sample and Sampling Procedures

The sample is a depiction of a larger population of the study target population which is selected and studied to represent the characteristics of the entire population. In other terms, the sample is the group of participants whom the researcher actually examines in an empirical investigation (Dörnyei, 2007). Sample selection and its size depend on the nature

of the target population and the nature of the research topic. Best and Kahn (1993, p. 19) postulate that:

> The ideal sample is large enough to serve as an adequate representation of the population about which the researcher wishes to generalise and small enough to be selected economically-in terms of subject availability, expense in both time and money, and complexity of data analysis. There is no fixed number or percentage of subjects that determine the size of an adequate sample. It may depend upon the nature of the population of interest or the data to be gathered and analysed.

It is paramount to note that very small size samples may not accurately be representative for the population and generalisation of data. On the other hand, larger size samples may lead to time and costs consumption. Finding, adequate size sample in regard to research purpose can balance the need for representativeness and resources constrain, and make a valuable contribution of statistical analysis of research data. Gay and Airasian (2000) recommend that for a population number of 900, a sample of 269 subjects is appropriate. In 2012, Gay et al., determined that for survey researches, it is common to sample 10% to 20% of the population; not only this, the adequate sample size depends on such factor as, the specific type of research involved, the size of the population, and if the gathered data will be analysed for given subgroups (p. 139).

For the purpose of this study, probability sampling procedures were used to give equal chance to members of the population to be selected to participate in the survey stage of the study. As said by Gay et al. (2012, p. 130) that simple random sampling is the process of selecting a sample in such a way that all individuals in the defined population have an equal and independent chance of selection for the sample". Therefore, a simple random sample of 39 EFL teachers at the department of English at Ibn-Khaldoun University of Tiaret was chosen as the informants for "the questionnaire". Additionally, having a colleague at the aforementioned department, it was easy to reach EFL teacher and send them the link of the online questionnaire to answer randomly without specifying which subject is likely to have more chance of response than another that is to say the sample is completely out of the researcher's control. The survey was sent to 39 teachers. 34 of the

EFL teachers submitted their answers. Hence, the sample of the survey in this study consisted of 34 EFL teachers determined by the number of the responses.

Regarding the semi-structured interview's participants, the researcher selected 1st year Master's degree EFL students of Didactic at the same department. The participants were selected based on their convenience subject to participants' geographical proximity, availability at a certain time, easy accessibility, and willingness to participate or volunteerism (Dörnyei, 2007). The researcher has selected 15 EFL students to conduct with them the interview based on subjects' intensity and information-rich. To extend this line of reasoning behind interview respondents' selection, Patton (1990, p. 170) confirms that "An intensity sample consists of information-rich cases that manifest the phenomenon of interest intensely (but not extremely)". The interviewees were divided into three groups of five participants in each to be asked in three different days to get enough time with respondents and drive as much as possible responses. Moreover, to get insights and understand teachers' practices regarding ICT use and whether the students are receiving adequate and enough ICT training. At this juncture, convenience sample is usually purposeful.

3.4.4. Sampling Error and Bias

Selecting what is known as a representative sample through several simple sampling techniques needs the following procedures; defining the target population, selecting a random sample, determining sample size, and avoid sampling error and bias. However, error is a reality with random sampling because no sample has the precise characteristics of the entire population and this variation that might occur within this sample is at the mercy of chance (Gay et al., 2012). Instead, if well selected and sufficiently large, the sample would closely represent the population (Gay et al., 2012, p. 139). In addition to error, sampling bias can stem from different resources such as when consciously and purposefully select group of individuals than the others giving no equal chance of being selected. This distorts the true characteristics of the population and making it challenging to draw valid data and inferences. Hence, in the present study, the questionnaire was addressed to randomly chosen 39 EFL teachers at Ibn-Khaldoun University of Tiaret out of 48 EFL teachers. With the exception of 5 teachers, 34 EFL teachers responded to the questionnaire. Which means that the majority of the population represent the sample. AT

the same token, when the majority of EFL teachers responded to the questionnaire this ensures the minimum rate of bias to occur within the sample which cannot affect the generalisability of findings to the entire population and the trustworthiness of the study.

On the other hand, following convenience sampling procedures in selecting interview's participants seemed appropriate as a sample selection technique due to students' availability, accessibility, willingness, and low-cost, as prime patterns for selection. Given to specific circumstances, this sampling approach regarded as appropriate, including that these participants were selected to get deep insights about teachers' practices using ICTs and they were rich-information subjects. That is to say, with regard to research questions and objective, the focus was on specific characteristics within this accessible group of informants. To mitigate bias, the researcher generates efforts to employ a diverse group of participants. Yet, it is openly acknowledged that the sample is not randomly selected that cannot be representative of the entire population and the findings cannot be generalised. While convenience sampling may introduce bias, triangulating and diversifying resources of data collection may minimise its impact and ensure the strength of validity and reliability.

Another issue to consider in sample choice and bias responses is that relying merely on online questionnaire may introduces response bias because some teachers who feel less comfortable or familiar with this type of questionnaire can be excluded. Furthermore, depending on self-report data via online questionnaire, respondents may provide socially acceptable responses rather reflecting their true attitudes and actual behaviours which may result in social desirability bias. Therefore, the researcher has used survey questionnaire and semi-structured interview as data collection instruments in this study to cross-check and cross-validate the obtained data from the questionnaire. At the end, it is not completely possible to avoid sampling bias but it is important to acknowledge whether the bias is so severe that the study results will be seriously affected (Gay et al., 2012).

3.4.5. Setting Description

The current research was conducted in the English department, at Ibn Khaldoun University of Tiaret, north-west of Algeria. It was established in 1980 and recognised by the Ministry of Higher Education and Scientific Research of Algeria. Speaking about the chosen setting, it seems important to know that Ibn-khaldoun University of Tiaret

encompasses more than 33000 students, 1071 teachers, and 1099 administrative and support staff. It includes 8 faculties, 2 annexes, and 1 institute. More than 20 departments are found in Tiaret University. In 2010, 6 new faculties and an institute were created; among them Faculty of Letters and Languages to be English introduced at the first time in Tiaret. The department was not an independent established entity. In fact, it was rather a branch affiliated with the department of Foreign Languages at the university centre, which comprised two main majors: French and English. The two departments have now been separated. This English department holds three License levels and two specialties in master's degree; being Didactics of English and Linguistics. The total number of EFL teachers in the department of English is 48. 34 EFL teachers were permanent teachers and 14 teachers were of part-time situation; holding Master's degree, doctorate degree, and PhD candidates. The total number of EFL students in the department is 1278; including 502 in L1, 275 students in L2, and 298 students L3. In master, 73 students belong to Linguistics specialty and 130 in Didactics.

This study setting was chosen by the researcher for special reasons. Particularly speaking, proximity and accessibility are among these reasons. Being a part time teacher at this university during the academic year 2019-2020 and having a colleague there provided the researcher with easy access to participants regarding EFL teachers and EFL students. Those 1st year master EFL students were among the former researchers' students whom she has taught that year. Teachers' cooperation and the facilities brought by the department facilitate to carry on the present study.

To wrap it all up, the choice of study setting and population is crucial for any researcher to conduct the research. The selection is generally a realistic choice rather than ideal which is known as accessible and available. It is possible to say that this choice from a narrowly defined setting and population saves the researcher money and time, yet threatens the ability to generalise about the target population. That is the data can be generalised only with the target organisation or institution but not all. Therefore, detailed description of the setting and the population is needed that "...others can determine how applicable the findings are to their own situations" (Gay, Mills, & Airasian, 2012, p. 130).

3.4.6. Research Instruments

This section provides a detailed description of the details followed to design the instruments and the strategies implied to ensure their validity and reliability. The actual survey instruments to be used in this study are questionnaire and interview. In fact, both the quantitative instrument (questionnaire) and the qualitative instrument (interview) were developed by the researcher to gather the needed data for this study.

3.4.6.1.EFL Teachers' Questionnaires

Emerging from the works of Creswell (2012, p. 382) and others, questionnaire is conceived as "a form used in a survey design that participants in a study complete and return to the researcher". Dörnyei (2007 citing Brown, 2001) determined it as a written instrument of a set of questions and statements to which respondents respond by writing their own answers or selecting from the existing answers. That is the same question in the same manner asked to all participants. The present study's questionnaire was designed to explore the factors that influence university EFL teachers' attitudes, acceptance, and use of ICTs, and in which way ICT Competence, Perceived Usefulness, Social Pressure, and ICT Training impact their attitudes and contribute in facilitating the incorporation of ICTs.

Taking into account that the questionnaire generally yields three types of data about participants helps in the design of this questionnaire. Precisely, Dörnyei (2007) determines that the questionnaire first consists of factual questions to find out particular facts about the participants such as demographic characteristics; including age and gender, level of education, occupation, and more. Second, it comprises of behavioural questions to find out about respondents' actions, habits, history, and what these respondents are doing or have already done. Then, it encompasses attitudinal questions to figure out people's thoughts, opinions, attitudes, beliefs, and interests.

At a procedural level, the researcher developed the questionnaire based on the previous outlined criteria as well as on the existing literature review of studies subject to the emergence of new educational technologies together with the new teaching/learning modalities and environments, the literature on the existing theories of attitude formation, functions, and correspondence to behaviour; in addition to innovation diffusion and adoption models and theories of technology such as theory of Planned Behaviour (Ajzen &

Fishbein, 1976), Diffusion of Innovation theory (Rogers, 1995), and Technology Acceptance Model (Davis, 1986). The researcher referred to existing literature to elaborate the teachers' questions to better cover the research objectives and answer research questions. To extend this line of illustration, Hoppe et al. (1995) state that the data gathered from the literature review contributes in the formation of the questionnaire for larger scale surveys.

What characterises the EFL teachers' questionnaire is the types of questions that were designed to gather certain information about the population of interest; including ICT competence, ICT attributes, attitudes-beliefs-perceptions, behaviour, and training. Respectively, questions about attitudes, beliefs, and behaviour are based on the 'Theory of Planned Behaviour to predict technology use. Ajzen and Fishbein (1976) and Ajzen (1993) assume that individual's attitude toward the behaviour, subjective norms, and perceived behavioural control, and their influence his/her intention are the basis to form persons' behaviour. Technology Acceptance Model was built on the basis of these assumptions of TPB with a number of adaptations. It proposes that any information system's usage can be a response predicted by individual's Perceived Usefulness and Perceived Ease of Usefulness of an innovation. TAM helps in providing the basis to formulate questions to trace the influences of external factor on internal beliefs, attitudes, and intentions of EFL teachers towards ICT usage. Moving further, Innovation Diffusion Theory posits explanation of end-user adoption of an innovation and the decision-making process that are pertained to the attributes of the target innovation, therefore, taking this into account in forming questionnaire's questions seemed to be valuable in formulating adequate questions to measure and explore teachers' attitudes towards the use of ICTs. Overall, the three theories were the basis of formulating questionnaire's questions.

As already illustrated, the quantitative instrument's questions and statements were constructed by the researcher and adopted from a previous literature research work according to the relevance to the present study and also adapted to better attain research objectives and gather the needed information. The questionnaire comprises eight sections that correspond to the main variables in this study in which positive and negative items are managed and balanced appropriately (see Appendix B). The sections are as follow;

- Section I: Teachers' profile and characteristics
- Section II: Teachers' experience and frequency of ICT use and university Equipment
- Section III: Training and support availability to ICT integration
- Section IV: Teachers' perceived usefulness
- Section V: Teachers' perceived ease of usefulness (Reflects Teachers' levels of knowledge on ICT and expertise)
- Section VI: Covid-19 as a social influence and pressure to impact teachers' attitudes
- Section VII: Post Covid-19 and intention of continuous use of Digital Learning Technologies (DLTs)
- Section VIII: ICT training (Perceptions and Beliefs)

There are two types of questions in this study's questionnaire. Close-ended questions were formed to allow participants choose one or multiple answers from the list of answers that were constructed by the researcher. Open-ended questions were constructed to permit respondents provide their own answers to express their own thoughts, opinions and presents details from their actual experiences. It was constructed as follow;

Section one of teachers' characteristics included five items to characterise EFL teachers in Tiaret University which were: Teaching experience, educational level, area of expertise, IT certificate possession, and experience of teaching ICT as a subject matter for didactic master students of EFL. The researcher included these questions in the questionnaire by holding the view of Gay et al. (2012, p. 131) who state that "A description of the sample you ultimately choose should include the number of participants and demographic information about the sample (e.g., average number of years teaching, percentage of each gender or racial group, level of education, achievement level)". Precisely, the gathered responses were treated as demographic descriptive information of study's sample. Teachers' teaching experience was measured by asking participants; including this year, how long have you been teaching? With a selection of 1 year, 2-5 years, 6-10 years, 11-15 years, or 15+ years as guided responses. Education background was also measured by asking responders what their accomplished academic degree is; listing them to: Master degree, Doctorate, or professor. Area of expertise was of guided responses organised into; Didactics, ESP, Linguistics, Civilisation, and Literature, or a possibility to provide a free-

response. The next item focused on whether those EFL teachers have any computer or information technology (IT) related certificate and next if they have ever taught ICT pedagogy as a subject specialty for didactic master degree students; both with a choice of "yes" or "no".

Section two encompasses (14) items regarding EFL teachers' experience, frequency of ICT use, and university equipment. The first five items were to measure the level and frequency of ICT access, how often they regularly design online courses and assign assignments to get their students work online, their engagement in online platform to conduct an online course as well, In addition to, lesson plan and course content selection via ICT use with a choice of always, often, sometimes, rarely, or never. Questions 6, 7, and 8 were asked to know if the University is well equipped with technological appliances and internet connectivity and how this internet is for those who respond yes. Question 9 was to ask teachers if they have ever experienced conducting an online course via an online platform. Question 10 was about the frequency they get their students engaged in online courses with a choice of two times a week, once a week, tow times a month, one time a month, only for assignments, or never. Questions 11, with a selection of three items respondents were asked to choose the type of assignments they assign to their students; requiring the use of the mentioned ICTs. In questions 12 EFL teachers were asked how often they discuss the use of technology in the classroom with their colleagues in the university. The 13th question in this section was asked to know whether university provides EFL teachers with the required technical support for ICT incorporation with a choice of all the time, only when needed, or never. A further sub-question was found for never responses to measure how teachers solve these technical pitfalls when no support is available.

The third section intended to measure the availability of training and support to integrate ICTs by asking responders if university district and staff provide adequate training to use technological resources and tools with a dichotomised choice of "yes" or "no". For respondents answering "yes" further 7 questions were asked to specify the type of training they received, in addition to three items to choose from to identify the quality of the received training too. For participants responding with "no" further 6 items were provided to choose from to demystify teachers' ways of developing their ICT knowledge and skills regarding the use of digital learning/teaching technologies. The classification of

statements established in this section will permit the researcher to gain insights into how the absence or presence of ICT training contributes the integration of educational technologies.

Sections from (4-8) were designed in a Likert Scale form because it is regarded as an adequate tool used in surveys to investigate teachers' attitudes as in the case of this study. Likert Scale is a psychometric response scale used in a questionnaire to measure responders' level of agreement or disagreement. Likert scale as a technique for attitude measurement can differ in the number of points of measurement; from two-points scale (agree/disagree), to more than seven-points scale. In the current study's questionnaire five-point Liker scale is used. McDonald (2004) stated that few points of responses may fail to estimate attitudes and more than seven points on a scale might cause a diminution of response clarity, and in studies where moderate responses are expected, five-point scale seems to be adequate and should be utilised. Therefore, the investigator adopted five-point likert scale to gauge EFL teachers' attitudes towards the use of technology, ranging from strongly disagree (1), through disagree (2), neutral (3), and disagree (4), to strongly agree (5).

Thirteen teachers' perceived usefulness-related statements comprised section's four scale. Section statements' key concept referred; respectively, to EFL teachers' belief towards the usefulness and attributes of educational ICTs, namely: a) relative advantage, b) compatibility, and c) observability. D) Complexity and e) triability are found in section 5. These beliefs and attributes were categorised in terms of improving the quality of teaching/learning, affording multiple educational opportunities, facilitating teachers' work and students 'collaboration and engagement, and providing a variety of online or digital learning resources.

EFL teachers' ICT competence and perceived ease of usefulness-related statements in section five reflect teachers' level of knowledge on ICT and expertise together with complexity and triability technology attributes. In this section the scale consists of 11 statements focusing on: possessing basic software and hardware competencies and skills, the ability to access, assess, and manage online course content resources, and the extent to which teachers find it easy or difficult to use these digital learning/teaching technologies. The statements comprised in this section will allow the researcher to identify the extent to

which ICT knowledge and skills tailor EFL teachers' attitudes and opinions regarding ICT usage.

The 6th Section's scale consisted of 10 statements divided into pre- and during Covid-19 to figure out in what ways the global pandemic influenced teachers' attitudes because subjective norms or social pressure influence individuals' attitudes and attitude-related behaviour (Ajzen & Fishbein, 1976). The statements took into account whether teachers were able to manage and use ICTs before Covid-19 and if they had positive attitudes towards their use. As well as, how teachers responded to the use of such digital technologies during the pandemic. Teachers' attitudes in post-Covid-19 were examined by a scale of 3 items found in the 7th section of EFL teachers' questionnaire focusing on: if this Covid-19 situation developed their knowledge of ICT pedagogies and content, whether teachers' performances and their students' achievements are improved, how important and indispensible the use of these digital learning technologies became for the EFL teachers together with knowing their future intention of continuous use of these technologies.

The last section's scale was devoted to teachers' beliefs and perception toward ICT training. Five statements intended to measure how strongly teachers agree or disagree on the effectiveness of ICT training. At the end of the questionnaire the researcher included three open-ended questions to allow teachers provide more suggestions and their own opinions regarding training and its quality if founded.

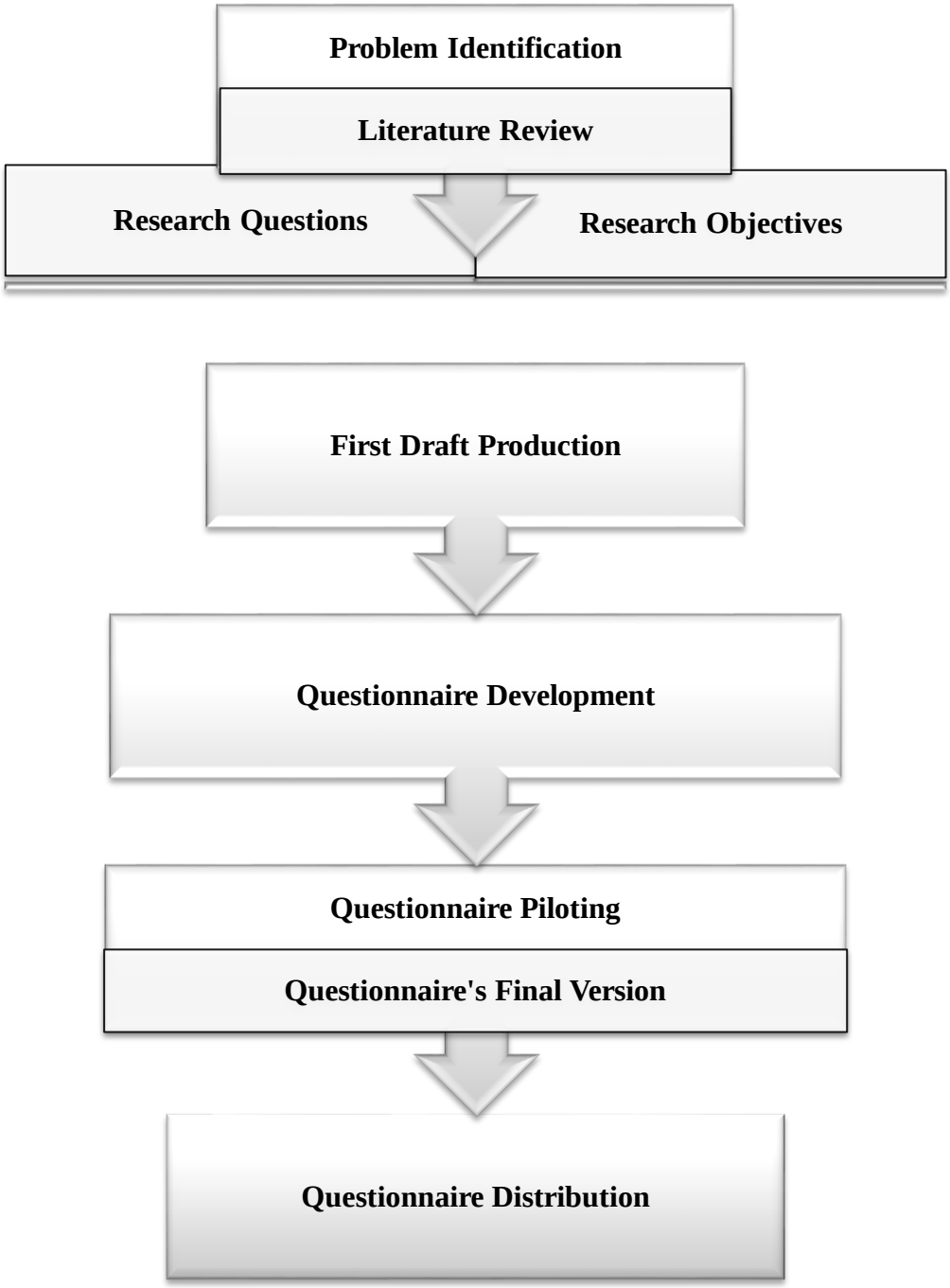


Diagramm.3. 2. Questionnaire design process

Time allocation for questionnaire is significant. Elaborating a good questionnaire entails deciding on the time devoted for the questionnaire's completion, the format, and anonymity with no excess of four to six pages and at least half an hour to be done (Dörnyei, 2007). Therefore, the questionnaire was designed using Google Forms and distributed online instead of printed form. The process of questionnaire's distribution was conducted for one month.

3.4.6.2.Interview Instrument (EFL Students)

Qualitative data collection methods involve in-depth, open-ended information that the inquirer collects via interview with informants who provide data from their own experiences, opinions, feelings, and knowledge (Best & Kahn, 1993; Creswell, 2014). In this fashion, a semi-structured interview was designed and developed by the researcher to gather more data from 1st year didactic master's degree students of EFL about the extent to which they are prepared as student teachers to integrate ICT in EFL in the future and to provide in depth explanations to quantitative information regarding teachers' attitudes towards the use of technology and ensure the trustworthiness of findings. Interviews seemed to be adequate to better unveil issues remained unanswered by the questionnaire. Moreover, interview's questions can be asked to figure out past or present information in addition to predictions for the future (Best & Kahn, 1993).

Interviews enable the researcher to have a direct contact with the participants of the study. The purpose of interviewing as Patton (1990 cited in Best & Kahn, 1993: 199) is to:

> find out what is in or on someone else's mind. The purpose of open-ended interviewing is not to put things in someone's mind (for example, the interviewer's preconceived categories for organising the world) but to access the perspective of the person being interviewed).

Types of interview range from the highly structured interviews which use close-ended questions to the wholly unstructured conversational style. Semi-structured interviews can provide reliable and comparable qualitative data where both the interviewer and interviewee improvise and engage in a flexible and fruitful discussion on the topic (Cohen, 2007). Semi-structured interview falls within the more conversational style and one-sided regarding input where research issues are raised by the researcher and get the participants involved in the conversation to explore those issues in-depth.

The interview in its focal meaning comprises a set of appropriately designed questions to extract a deep understanding of participants' knowledge, attitudes, experiences, or opinions. In the present study, the interview was carried out with the aim of understanding in-depth the EFL teachers' use of ICT and students' preparedness to use ICT. Hence, the statements of the semi-structured interview deployed to the participants were based on two

expected findings; the extent to which EFL teachers are experiencing the use of educational technology with their students and to what extent their teachers are preparing and training them to apply and use digital learning technologies to the teaching and learning of EFL.

Overall, having a discussion with students about teachers' practices and the extent to which they use ICTs in their teaching; either in the classroom or in distance learning, can provide an understanding of teachers' attitudes towards ICTs. Evidently, ICT training in this study was a variable to measure its correlation with teachers' attitudes. The researcher read the same questions to the interviewees to ensure the same wording with all the participants of the semi-structured interview (see Appendix C).

3.4.6.3. Validity and Reliability (Piloting the Instruments)

To ensure the validity and reliability of research data-gathering instruments, the researcher employed a range of methodological procedures. At a procedural level, the terms Validity and Reliability are essential criteria for quality and to the "effectiveness of any data-gathering procedure" (Best and Khan, 1993, .208). In their terms, Validity refers to "quality of data-gathering instrument or procedure that enables it to measure what is supposed to measure" and Reliability is "the degree of consistency that the instrument or procedure demonstrates: whatever it is measuring, it does so consistently" (p. 208).

In similar words, Gay et al. (2012, p. 160) refer Validity to "the degree to which a test measures what it is supposed to measure and, consequently, permits appropriate interpretation of scores". The foundation of Validity depends on an understanding of the interpretation to be made from the chosen instrument. Consequently, it entails the gathering of various sources of evidence substantiate the intended interpretation (Gay et al., 2012). Simply put, it is significant to identify the purpose that the instrument used for and with whom is used so that it is easy to ensure its validity.

To maintain the validity of the present study's research instruments the researcher highlights the importance of ensuring that both the survey questionnaire and interview accurately measure what they intend to measure. For this reason, an interest appears to put an emphasis on the need for multiple resources of evidence to support the validity of the

research instruments. This includes considering: face validity, content validity, and construct validity.

As an initial assessment, face validity can be helpful. It refers to "the degree to which a test *appears* to measure what it is claims to measure" (Gay & Airasian, 2000, p. 163). Despite the fact that it is not a psychometrically strong evidence of estimating validity, this process sometimes sounds as a screening procedure in test's selection (Gay et al., 2012, p. 161). Face validity indicates whether a measurement seems to be relevant and appropriate relying on the superficial appearance. It is followed by Content validity which refers to the extent to which "does this test represent the general domain of interest?" (Gay et al., 2012, p. 161). They explain that content validity intends to capture whether the instrument items effectively capture the target domain of content being measured.

To assert strong evidence of validity, the before mentioned forms of validity should be supplemented with Construct validity which refers to the extent to which "does this test reflect the construct it is intended to measure?" (Gay et al., 2012, p. 161). Construct validity raises the fundamental validity query: What is the real essence being measured by this data-gathering instrument? That it is pertained to the degree to which a test measures an intended hypothetical construct (Gay et al., 2012, p. 163).

In this study, a panel of experts was developed to establish the validity of the research instruments. Face validity was established by peer review; of two PhD candidates, and supervisor review. Content validity has been determined by experts' judgements. The panel of experts; consisted of three experts (see Appendix A). They carefully reviewed the research instruments' items and made judgements about how well the items are developed and represent the intended content area to assure comprehensive coverage.

As a feedback, all of the experts and peer-reviewers provided valuable insights into instruments' validity; they suggested some modifications based on their expertise and experience. Regarding the questionnaire, they proposed to minimise the length of the questionnaire. After that some questions were refined and other developed to better meet the requirements of this study. Concerning construct validity, both the questionnaire and the interview were piloted. The rate of the responses from the survey questionnaire indicates that the respondents understood the questionnaire's content. These scores demonstrated that the questionnaire measures what it aims to measure. The interview

statements were piloted on five participants on January, 2023 to ensure that the questions were comprehensible to the informants. Owing to the flow of the pilot testing of the interview and positive feedback no modification was made.

Besides, before gathering the main data of this study, the researcher conducted a pilot study not only to ensure the validity of the research instruments, but also to determine their reliability. It is crucial to note that reliability addresses the degree to which a research instrument exhibits consistent measurement of its intended construct or variable, i.e., dependability and trustworthiness. Precisely, the test is reliable when the obtained scores from that test are essentially the same scores that would be attained; supposing that the test re-administered to the same test takers at a different point of time or by another person. If it provides consistent information about a performance or an attitude for example, the test is reliable then; if not the test is unreliable (Gay et al., 2012).

As an undertaken measure to establish reliability in the current study, **test-retest reliability** was used. The researcher conducted a pilot study to test the research instruments. With regard to the questionnaire, it was piloted with a representative group of 6 subjects, the interview administered to 5 subjects. All the subjects were volunteers from the target populations and all of them were participants in the samples of the study. Each instrument was administered to the same group of subjects on two separate occasions with time interval of two weeks between the first and second instrument's administration. After that the researcher compared the data gathered from the responses to assess the stability and consistency of the survey questionnaire and the interview. Based on the pilot study, test-retest reliability scores show high level of correlation.

Evidently, as Creswell (2012) postulates that a pilot study is a procedure that permits the investigator to make a modification over a research instrument based on the feedback from a small number of individuals completing and assessing the instrument. In present research, the very purpose of doing a pilot study is to estimate the validity and reliability of research instruments and ensure quality in quantitative and qualitative paradigms. Overall, establishing a panel of experts and piloting the research questionnaire and interview aim to guarantee their validity and reliability, reduce the threats, and address the potential limitations by incorporating various forms of evidence.

3.4.7. Data Collection Procedures

After EFL teachers' questionnaire and EFL students' interview approval and piloting, the data collection phase began with the administration of an online questionnaire using Google Forms to ensure quick access to the survey questionnaire and easily receive data back. EFL teachers were invited via email to complete the online questionnaire. Indeed, web-based procedures are inevitable for data collection especially with the growth of internet.

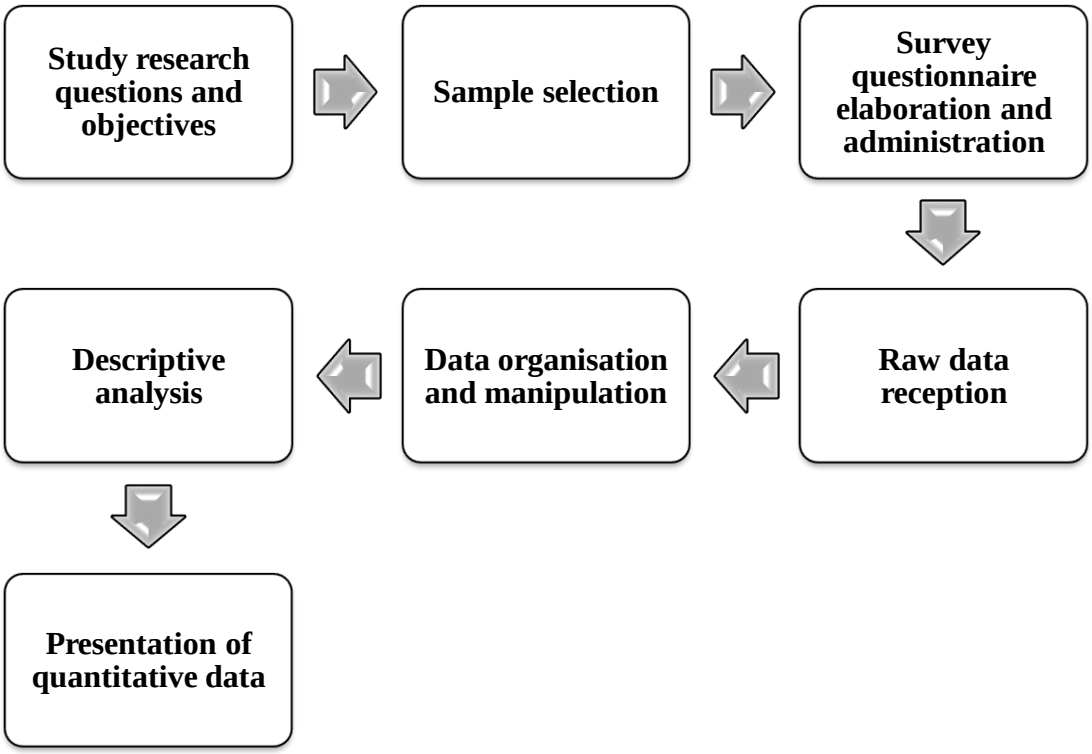


Diagramm.3. 3.Quantitative data collection procedures

Regarding interview's participants, the researcher visited university to invite students to participate in the interview. EFL students' interviews were divided on three days, five students for day to ensure students' availability and devote the time needed for answering so that to allow them fully express their ideas and assure the quality of data collected. The the purpose of the study was clearly explained at the beginning of the interviews to ensure

their full participation and contribution. Responses from the interviews were audio-taped by the researcher to be transcribed and interpreted after.

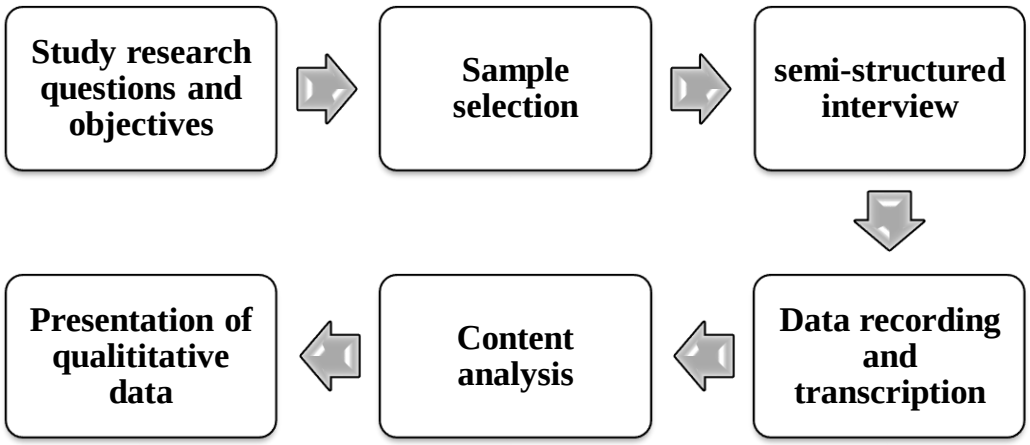


Diagramm.3. 4.Qualitative data collection procedures

3.4.8. Data Analysis Procedures

Once data is gathered, edited, and coded, the following step is to drive meaningful insights from it. The following discussion on data analysis procedures, explains the followed data analysis methods to analyse the collected quantitative and qualitative data.

3.4.8.1.Descriptive Analysis

To analyse the quantitative data in this study, descriptive statistics was used. It was employed to describe and summarise the features of the collected data from the participants (Gay and Airasian, 2000). It "describes trends in the data to a single variable or question on your instrument" (Creswell, 2014, 182). It was also used to infer the features of the population from the properties of the sample to draw conclusions. Creswell (2014) and Dörnyei (2007) rightly suggest that multiple steps are found to be used in data analysis process of quantitative data.

The first step is to prepare and organise the data for analysis; involving assigning numeric scores to the data and inputting it into a program. In fact, this has completely

changed with the development of various software packages. Second step starts data analysis by conducting descriptive analysis of reporting measures of central tendency and variation, then observe differences to test hypothesis

To collect data and do analysis in this study, Google Forms is used as a means to collect questionnaire's data. It stores the received feedback to be analysed in details. Actually, "ease of use is an important factor when selecting a (statistical) program" and includes the types of statistics that will be used to answer research questions and hypotheses (Creswell, 2014, p. 178). It enables the researcher to analyse the data by organising the results in spreadsheet with Google sheets where many formulas and functions are found; from simple calculations to performing more complex ones such as average and means. It summarises results in pivot tables, charts and graphs. Spreadsheet tables "used in many popular software packages (e.g., Excel)" (Creswell, 2014, p. 179).

So Google Forms; as a statistical package, with its spreadsheet "such as Microsoft's Excel can do a fair amount of statistics" (Dörnyei, 2007, p. 198) and output graphs and tables that can be used in research data analysis and reports. Descriptive statistics were described using frequencies and descriptive such as percentages and counts. Dörnyei (2007) states that these procedures of data analysis are the most commonly used ones which show the proportion of observation in each value or data that allow easy understanding of the distribution of data and allow the researcher to identify trends and features. Having said that, observing the differences of percentages of collected data from the selected sample permit to estimate and predict the relationship among the independent variables and the dependent one to test the hypotheses, make predictions, and draw conclusions about the larger population.

At the broadest sense, to conduct a research, a number of principles have to be determined so that any systematic observation and description of characteristics of the sample under study have a commonly understood meaning (Best & Khan, 1993). They indicate that "measurement is the most precise and universally accepted process of description, assigning quantitative values to the properties of objects or events." (p.174), for the purpose of determining relationships between variable and develop generalisations to explain the phenomenon being studied and predict future occurrences.

3.4.8.2.Qualitative Content Analysis

The analysis of the qualitative data follows the path of content analysis method involving systematically identifying and categorising themes and patterns in data. Dörnyei (2007, p. 246) suggest that in conducting a qualitative content analysis there are four phases in the analytical process to follow: (a) transcribing the data, (b) pre-coding and coding, (c) growing ideas-memos, vignettes, profiles, and other forms of data display, and (d) interpreting the data and drawing conclusions. Precisely, the first step in qualitative data analysis is to transform the recordings into textual form to allow the researcher gets an overview about the data. Second, meeting data meaningfully by means of reading and re-reading which shapes researcher's thinking and reflection, as Dörnyei states that at this point analysis starts and put data into special features of segments. Third, coding other tools should be used to have structured reflection. Interpretation of data in fact does not occur as a final process, it starts as early as the coding phase begins till choosing "the overarching theme and themes that the write-up will be centred around" (p. 57) and where conclusions are built.

Keeping these steps in mind, in the current study, after receiving and gathering all the data, interviews were transcribed then coded. Within this process, the data has been organised into themes and sub-themes where an extensive reading of the transcribed responses are conducted. Then the categorisation of data was undertaken. After, codes were created based on those categories to identify and establish themes and interpret them.

3.5. Ethical Considerations in Research

The achievement of the desired outcomes includes the ethical and proper methods. In respect of ethical concerns relevant to research, it is important to obtain permission from the relevant authorities. In this study, the researcher gained approval from the Faculty of Letters and Languages at the University of Mascara (Algeria) to conduct this research at the beginning of the doctoral training. In addition, to make information consent for both the questionnaire and the interview, the researcher started with clear statements to explain the nature and purpose of the study. Also, the confidentiality and anonymity were asserted in this informed consent to ensure that data is only accessed by the researcher and the supervisor for academic purposes. The well-being of the participants in conducting the present research was prioritised. Trust between the researcher and the participant forms the

foundation of research studies “researchers have a responsibility to behave in a trustworthy manner, just as they expect participants to behave in the same manner” (Gay et at., 2012, p. 19).

Among the ethical considerations, the encountered limitations are transparently communicated within this study; including research process, methodology, the sampling methods and procedures together with data analysis to permit the readers and reviewers assess the generalisability of the results.

3.6. Conclusion

This chapter identifies the fundamental components for regulating and organising the essential methodological procedures and plans to conduct this study. The outline of the steps has directed attention to the description of the nature of the study with a clear discussion about the purpose of research approach selection. This chapter presents the research design including the identification of the population and sample. It depicts the methods used in sampling and selection of research participants. Also, there is a discussion about research instruments to be used. Survey questionnaire and semi-structured interview were used as methods for data collection. The questionnaire administered online and the interview conducted through face-to-face meetings. The design also includes the description the procedures employed in quantitative and qualitative data collection together with the followed steps in interpreting and analysing the gathered data. The next chapter focuses on reporting findings, analysis, and interpretations.

Chapter Four: Data Analysis and Interpretations

4.1.Introduction

The results of the questionnaire distributed to EFL teachers and of the interview conducted with first-year master's degree EFL students are presented in this chapter. This latter highlights how these findings provide evidence of EFL teachers' actual use of technology in tertiary education, as well as the factors influencing their attitudes towards its use. The first section presents the results of the questionnaire, with sub-sections reporting descriptive statistics of: a) EFL teachers' Profile b) their experience and frequency of using ICT and university equipment, c) the availability of training and support for ICT integration, d) the perceived usefulness and ease of use of ICT by EFL teachers, e) the impact of Covid-19 as a social pressure on EFL teachers' attitudes towards the incorporation of ICTs (before, during, and after), and f) teacher' perceptions of the effectiveness of ICT training. In order to investigate and cross-validate the gathered quantitative data, the third section offers the findings from qualitative data which summarises the themes, patterns, and interpretations that emerged from EFL students' interviews. The findings from the two data collection instruments are discussed in the next section. The last section in this chapter includes a summary of the main findings.

4.2.Questionnaire Analysis

In this section, the measurement of teachers' attitudes; as referred to in chapter two and three, is done through analysis of affective, cognitive, behavioural, and subjective norms as elements. The findings help figure out teachers' attitudes towards ICT use and the factors that impact their attitudes; including teachers' prior experiences with and frequency use of ICT, university equipments, teacher' Perceived Usefulness (PU) and Perceived Ease of Usefulness (PEoU) towards ICTs, Covid-19 as a social pressure and unprecedented circumstance for educational change and technology use. They help also explain the way teachers' level of ICT knowledge and ICT training are likely to govern teachers' attitudes and influence their future intentions' of technology use together with their continuing professional development (CPD). Key findings from quantitative data analysis are presented in relation to research questions 1, 2, 3, and 4.

4.2.1. Teachers' Profile

This section provides a comprehensive overview of the demographic profile of the study's participants by highlighting the key factors that shape their educational background, identities, and experiences. Respondents' description also facilitates a nuanced analysis and interpretation of the gathered data.

The characteristics of EFL teachers are presented in terms of teachers' profile which includes information about their educational level, teaching experience, area of expertise, the possess of Information Technology (IT) related certificate (s). The next question was about whether they have taught ICT pedagogy as a subject specialty for Didactic Master's degree students (Table4.1).

The respondents' responses on their teaching experience item demonstrated that 32, 4 % of them had more than 15 years of experience, equally, 32, 4 % of them had 2 to 5 years of experience, 29, 4 % had 6 to 10 years, and 5, 9 % had 11 to 15 years. Through self-identification, 61, 8 % of the informants identified themselves as having doctorate degree; 20, 6 % were part-time teachers' with master's degree. Professor and magister holders were in the minority with 14, 6 % for the former, and 2, 9 % for the latter. Regarding the educational area of expertise of the participants, half of them (50, 00%) teach Didactics. 17, 6 % of them teach ESP. An equal number 17, 6 % reported that they teach Linguistics. 2, 9 % of the respondents mentioned that they teach Civilisation. 5, 9 % noted that their area of specialty is Literature. In "Other" option, 2, 9 % reported Gender studies, Sociolinguistics, and Diversity as their branch of expertise. 2, 9 % said that they teach Translation.

Most of the participants (55, 9 %) reported that they had no Information Technology (IT) related certificate (s). 44, 1% of them declared that they had obtained that certificate. The great majority of the respondents (85, 3 %) reported that they did not teach ICT pedagogy as a subject specialty for didactic Master's degree students. On the other hand, 14, 7 % of them acknowledged their experience of ICT didactics.

Variable	Category	Number	Percentage %
Teaching Experience	1 year	/	/
	2-5 years	11	32,4
	6-10 years	10	29,4
	11-15 years	2	5,9
	+15 years	11	32,4
Educational Level	Master Degree	7	20,6
	Magister Degree	5	14,6
	Doctorate		
	Professor	21	61,8
		1	2,9
Area of Expertise	Didactics	17	50
	ESP	6	17,6
	Linguistics	6	17,6
	Civilisation	1	2,9
	Literature	2	5,9
	Other	2	5,9
Possession of IT-Related Certificate (s)	Yes	19	55,9
	No	15	44,1
Teaching ICT Pedagogy			

Table.4. 1. Teachers' Profile

4.2.2. EFL Teachers' Experience, Frequency of ICT Use, and University Equipment

Participants were asked to rate their frequency of use of ICT for curriculum preparation and design, creating online learning activities and practices, planning lessons, searching for courses' content and materials, and in classroom via overhead projector together with

computer and PowerPoint presentation, (Table4.2). Findings were displayed as percentages on a scale of five-point scale ranging from (always) to (never).

	Percent %				
Statements	**Always**	**Often**	**Sometimes**	**Rarely**	**Never**
1. I use ICT in curriculum preparation and design	41,18	41,18	8,82	5,88	2,94
2. I use ICT in the classroom through over head projector and computer use together with PowerPoint presentations	35,29	44,12	14,71	5,88	/
3. I design online learning activities that require my students to work online	26,47	26,47	29,41	11,76	5,88
4. I incorporate ICT in lesson plan	32,35	35,29	23,53	5,88	2,94
5. I search for course' s content and materials resources online	61,76	32,35	5,88	/	/

Table.4. 2.Teachers' Frequency of ICT use

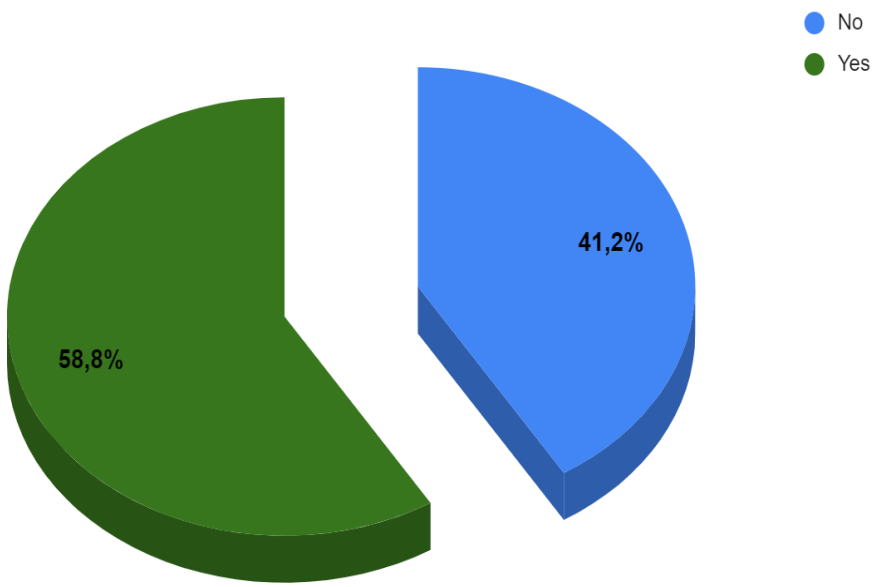
Table 4.2 demonstrates that (41, 18 %) of the participants "always" use ICTs in curriculum preparation and design. Equally, 41, 18 % of them reported "often". 8, 82% of them indicated that "sometimes" make use of ICTs in curriculum foundation. 5, 88% of them stated "rarely" and 2, 94% reported "never". Concerning the use of ICTs in the classroom through overhead projector and computer use together with PowerPoint presentations, 35, 29% of the respondents mentioned "always". 44, 12% of them stated that they "often" use these technologies. 14, 71% of the participants reported an occasional use of ICTs. 5, 88% of them identified their use as "rare".

Besides, 26, 47% of the informants indicated a frequent use of ICT in designing online learning activities which require their students to work online. Equally, 26, 47 % of them mentioned a constant use. While most of the respondents (29, 41%) reported that they have an occasional use. 11, 76% of them stated they "rarely" use ICTs. Only 5, 88% noted "never". Regarding the use of technological tools in lesson plan regularly, 32, 35% of the respondents reported "always". The majority of them (35, 29%) reported that they use such

technologies frequently. Yet, 23, 53% of them indicated occasional use. 5,88% of them described their use as “rare” and 2, 94% indicated “never”.

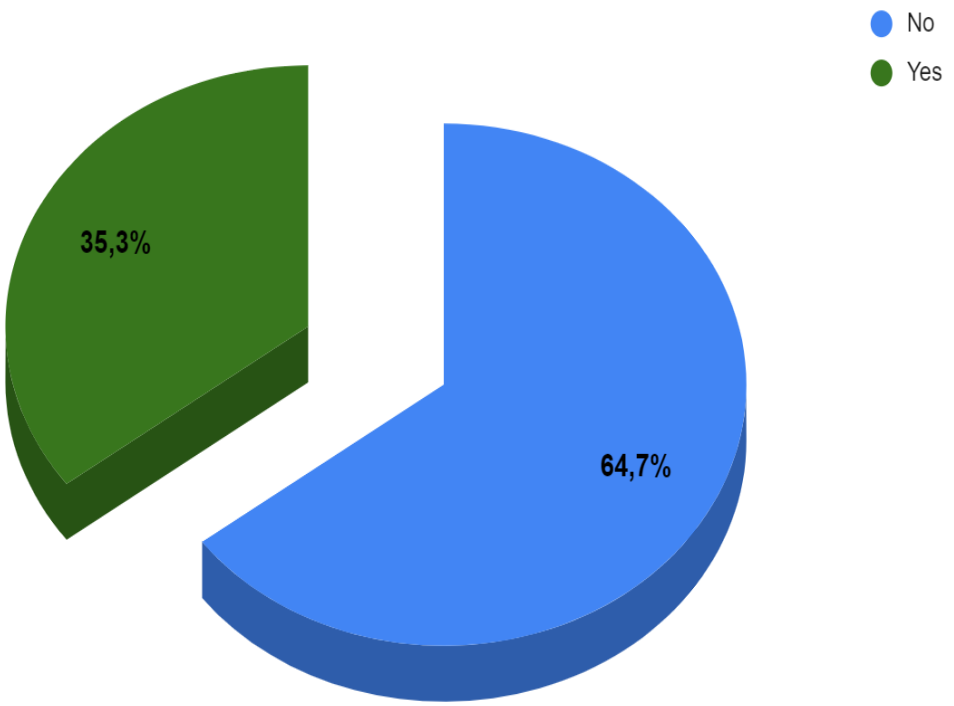
As depicted in table 4.2, data illustrates that the majority of the participants (61, 76%) “always” make use of ICTs to search about course content and materials. 32, 35% of them revealed frequent use. 5, 88% of them portrayed their usage as “sometimes”. Overall, these findings suggest that the majority of EFL teachers have frequent use of ICTs. However, their usage does not extend beyond mere lesson planning and basic use of tools such as overhead projector and PowerPoint presentations. They actively use ICTs to search for online resources and materials for effective teaching and fostering improved learning outcomes. The results demonstrate that EFL teachers are not using these digital tools, since they find it more complex.

Participants were asked whether their university provides them with the needed educational technological devices such as overhead projectors and speakers for classroom use with students. Over half of the respondents (58, 8%) indicated the availability of university’s technological equipments. While, 41, 2% of them mentioned that there is a lack of such devices; stating that sometimes when they need these tools they find that another teacher took them (Pie-Chart4.1).



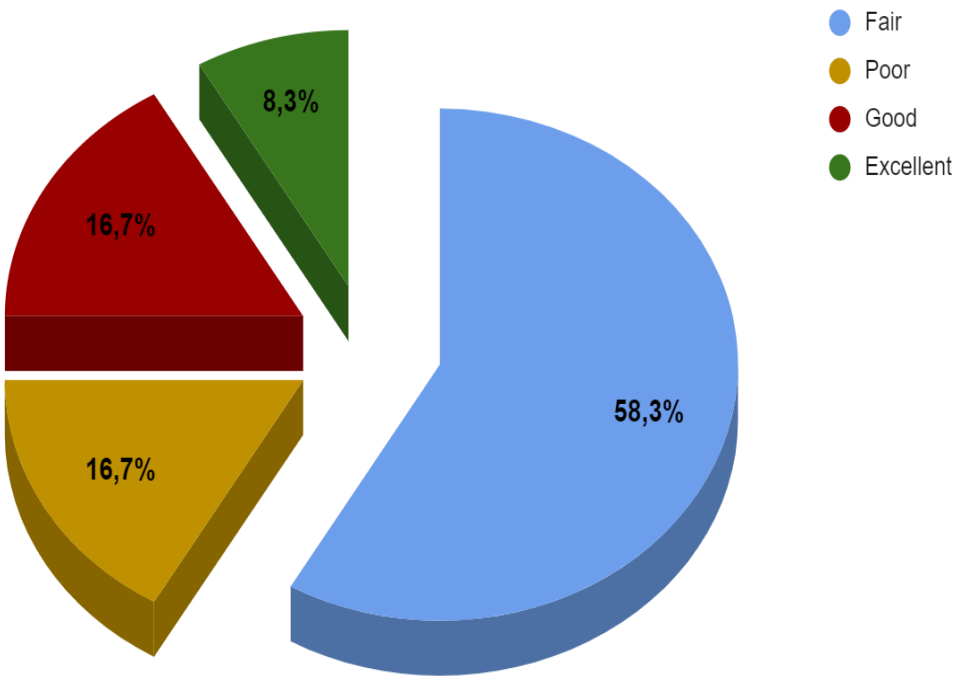
Pie-Chart.4. 1.EFL teachers’ Access to University’s Technological Appliances

Asking the respondents about Internet accessibility and its quality at their university, a great proportion of them (64, 7%) indicated an absence of the network from one hand. On the other hand, 35, 3% of them acknowledged the presence of internet accessibility and availability (Pie-Chart4.2).



Pie-Chart.4. 2. Internet Accessibility at University

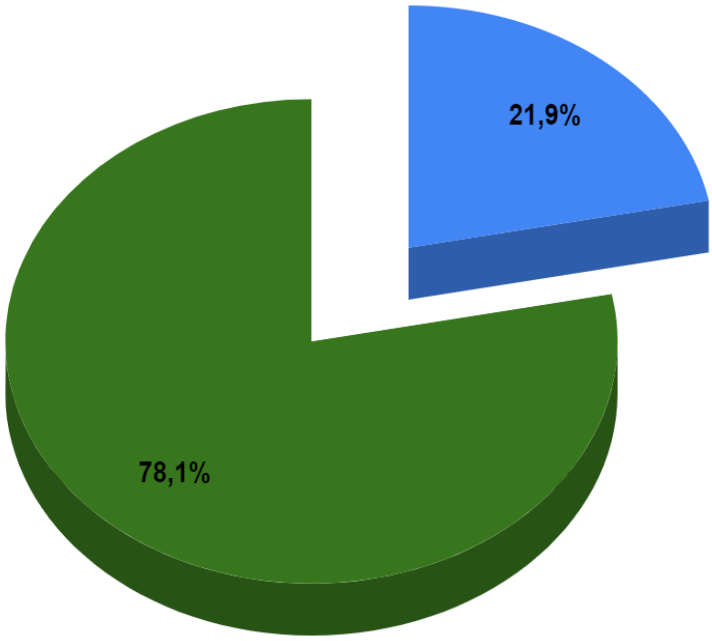
Those participants who said “Yes” (35, 3%) were using their own phone data to connect with. At the same time they were asked to rate its quality on a scale of 4 points ranging from “excellent” to “poor” (Pie-Chart4.3).



Pie-Chart.4. 3. EFL Teachers' Rating to Internet Quality

It can be seen from the data in Pie-Chart4.3 that "Fair" was the participants' most frequent response (58, 3%). 16, 7% of them stated that the quality of internet is "good". Similarly, 16, 7% of them described Internet's quality as "poor". Yet, 8, 3% described it as "excellent".

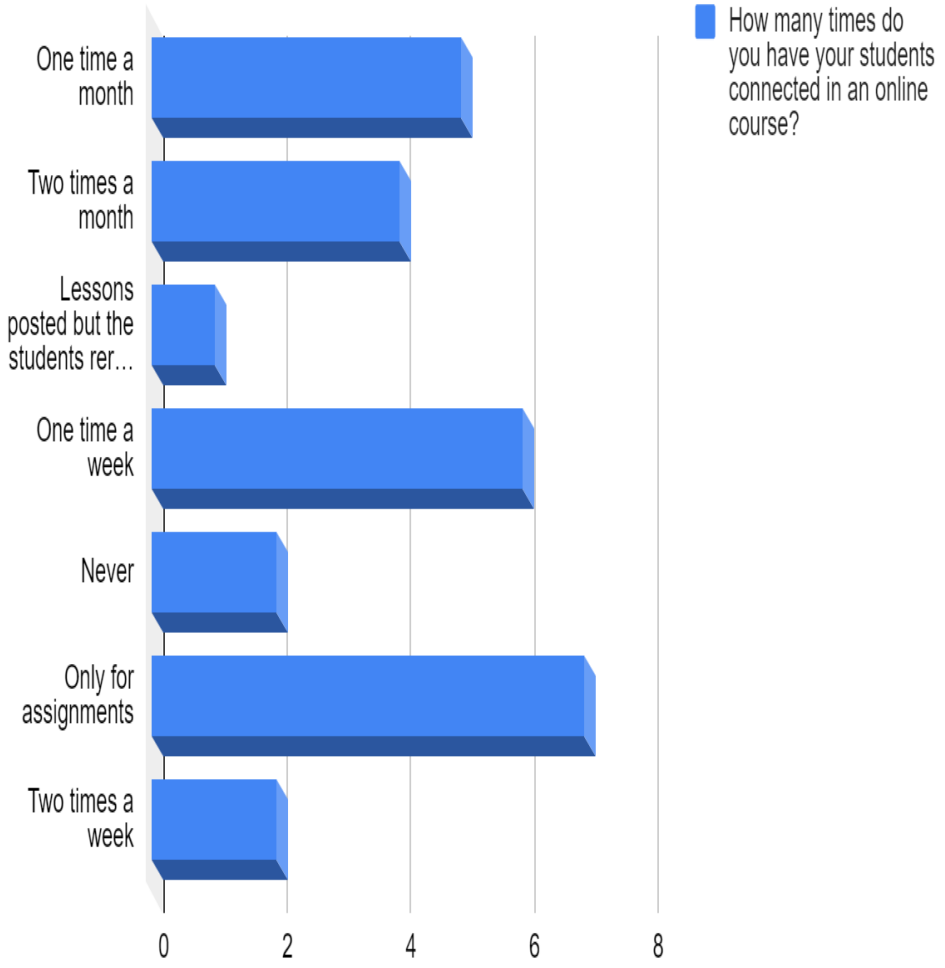
As for experiencing the use of ICTs through online platforms' usage to conduct online courses, Pie-Chart4.4 presents EFL teachers' frequency of use.



Pie-Chart.4. 4.EFL Teachers' Use of Online Platforms in Conducting Online Courses

As can be seen from the pie-chart4.4, there is a remarkable result that the majority of the participants (78, 1%) indicated their consistent use of online platforms. However, the remaining number of the respondents (21, 9%) acknowledged their infrequent engagement. This division of online platform use and involvement can be a result of many factors that will be further explained.

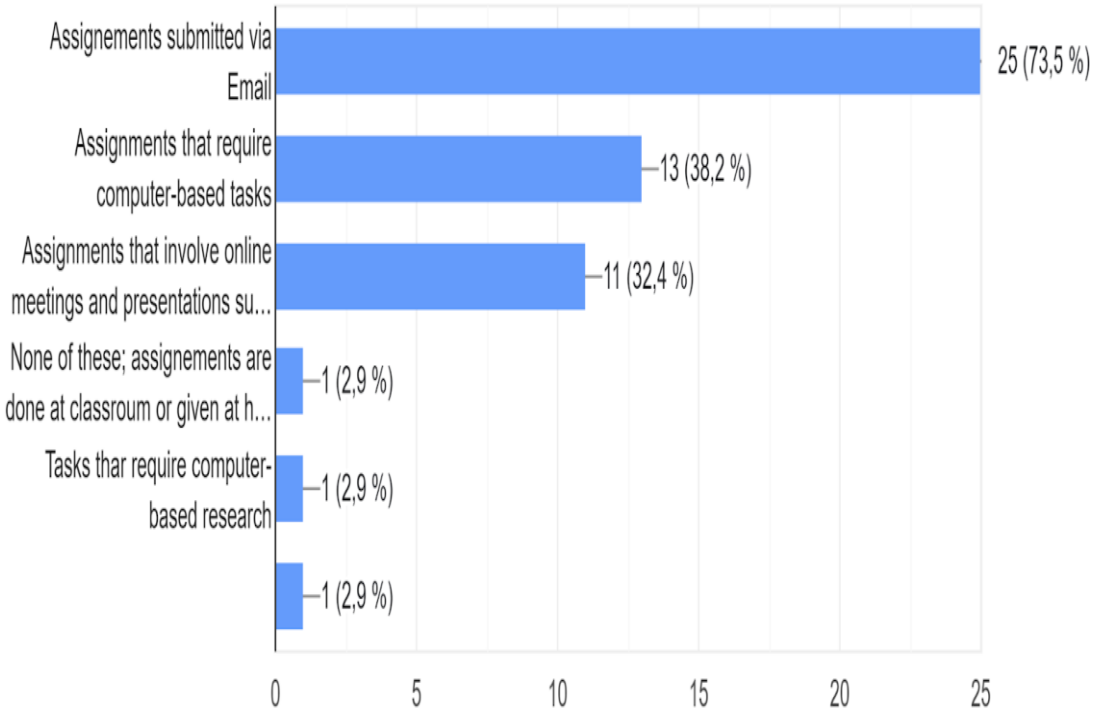
In the same vein, the participants; who revealed their frequent technological tools usage (79, 4%) were asked to specify the frequency that they get their students connected in an online course (Bar-Graph4.1).



Bar-Graph.4. 1. EFL Teachers' Frequency of Online Platforms' Use

The above mentioned Bar-Graph 4.1 elucidated that 25, 9% of the informants stated that they engage with their students online exclusively for assignments. 22, 2 % of them specified that they interact with their students "One time a week". While, 18, 5% of them reported a monthly interaction choosing "one time a month" option. Further, for 14, 8% of the respondents, teachers' online commitment with the students occurred twice a month i.e., "two times a month". A minority (7, 4%) of them described their online engagement "as tow times a week". Surprisingly, 7, 4% of the informants revealed that they "Never" connect with students online. About the responses to the option "Other", only (3, 7%) one teacher provided additional information. This participant commented that "*lessons posted but the students rarely access the platform*". Despite teachers' engagement into online platforms, the rate of the frequency of involvement is still low.

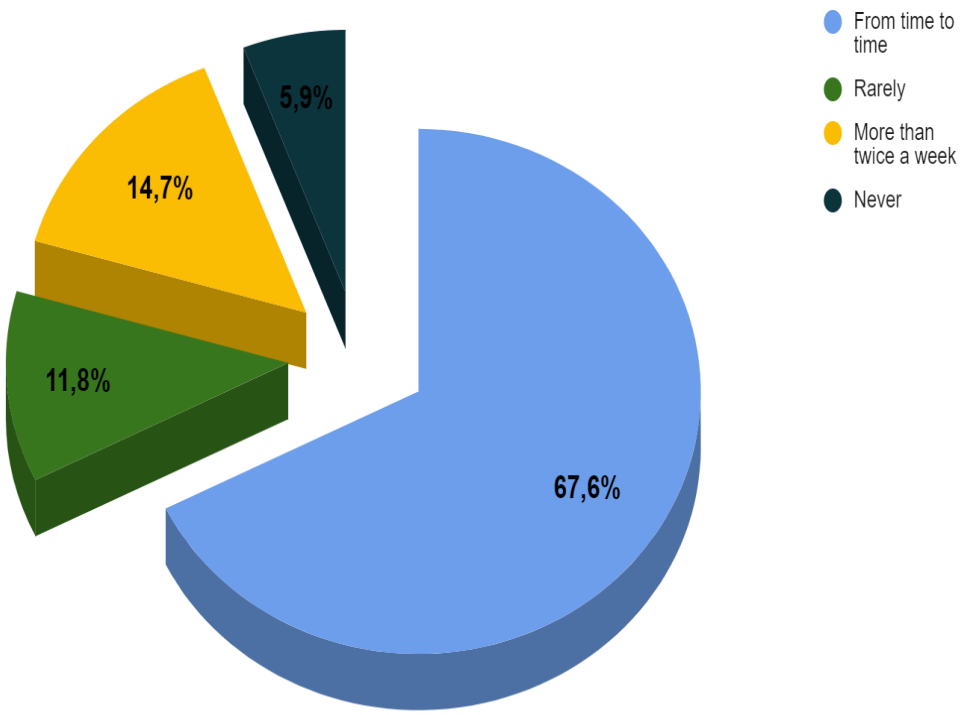
In order to have deeper insights about teachers' ICT use in their teaching practices, they were asked to specify the type of assignments that they assign to their students through technology usage (Bar-Graph4.2).



Bar-Graph.4. 2.Types of Assignments that EFL Teachers Assign to their Students

Bar-Graph4.2 depicted that the great majority of the participants (73, 5%) reported that they regularly assign to their students assignments submitted via Email. 38, 2% of them mentioned that they allocate computer-based tasks. 32, 4% revealed that students are given educational works which involve online meetings and presentations such as on Google Meets and Zoom. Regarding "Other" option, three participants indicated that the activities are done at the classroom or given at home to be turned back later on. A significant portion of teachers focuses on using simple basic technological tools. In fact, the use of ICTs is not limited to basic hardware skills.

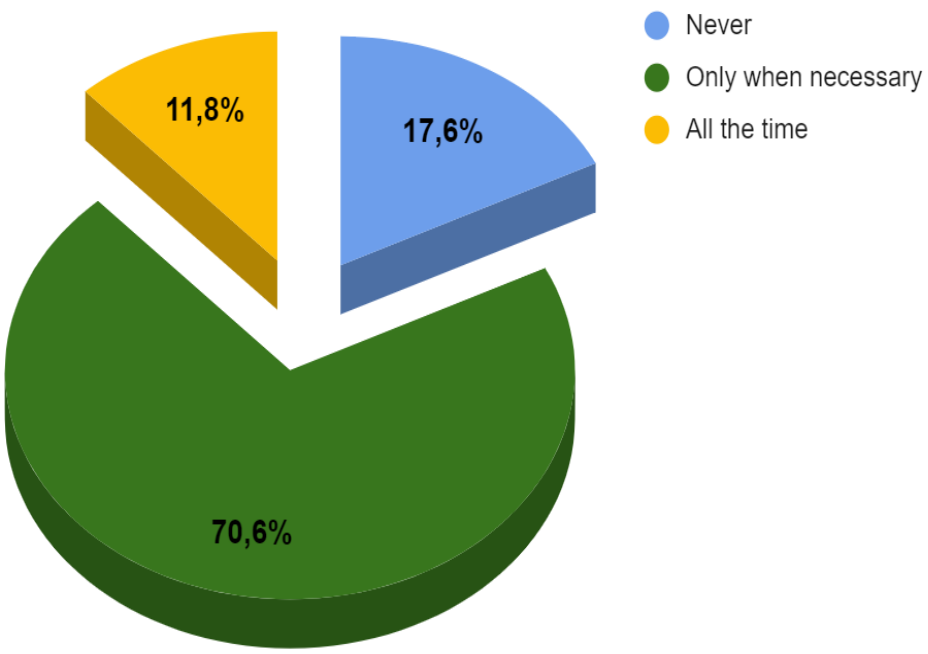
In the process of examining teachers' attitudes towards the use of ICTs, they were asked about the frequency they engage in discussions about technology integration their teaching practices (Pie-Chart4.5).



Pie-Chart.4. 5.Discussion Occurrences about Technology Use into Teaching among EFL Teachers

As illustrated in Pie-Chart.4.5, almost two-thirds of the participants (67, 6%) reported that they engage occasional i.e., "from time to time" discussion about the use of technology in classroom with colleagues. Yet, 14, 7% noted that they undergo in such conversations "more than twice a week". Additionally, 11, 8% of the participants acknowledged that they rarely talk about this topic. Surprisingly, 5, 9% of them indicated "Never" with a total absence of "daily" discussion among the questioned participants. This means that the great majority of the surveyed EFL teachers feel comfortable with educational technologies usage, they liked to talk about them and appreciate using them in teaching.

As part of gathering information related to university's technical support provision in process of technology use, participants responded to questions of whether they are provided with the necessary support to incorporate ICTs and how they solve technical issues (pie-Chart4.6).



Pie-Chart.4. 6.University's Technical Support Provision to EFL Teachers

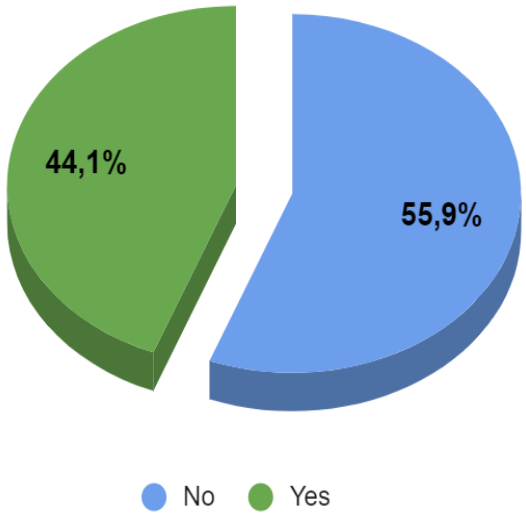
17, 6% of the respondents reported that they never receive support from the administration this is on one hand. On the other hand, 70, 6% of the respondents indicated that their university provides them with technical support only when necessary. Yet, 11, 8% of them affirmed its consistent availability while selecting the option "all the time". Notably, those teachers who actively engage with technology incorporation in their teaching practices are often the ones who seek out and take the initiative to arrange an optimal educational environment instead of waiting external assistance. They have positive attitudes towards technology integration. Additionally, the six EFL teachers who reported a total absence of technical support were directed to respond to how they solve the encountered problems during the process of technology usage. In this regard, they commented that they "*rely on what their students have*". Others "*have their own technological devices, so, they generally do not need the requirements of the university*". For some participants the best solutions were "*asking for help*" or "*through the search and discussion with colleagues*". Among these participants, solving technical issues was based on their reliance on "*on their personal skills, resources, expertise and expertise*."

The aforementioned comments elucidated that despite the scarcity of university equipments provision and technical constant assistance, EFL teachers were trying to figure out ways to imply ICTs into their educational practices. Again, this can reveal an interesting depiction of EFL teachers' inclination towards educational technologies integration into teaching and learning practices.

The results in this section revealed that teachers use ICTs for curriculum design, lesson planning, searching about courses' content and materials resources. Furthermore, they have constant discussion regarding the value of technology integration into education that is the great majority of teachers have positive attitudes towards the use of ICT in teaching and learning. However, teachers' level of proficiency is still questionable in addition to a lack of Internet accessibility, its poor quality, and the lack of technical support which can be other factors that hamper adequate ICT integration into EFL teaching and learning processes.

4.2.3. Training and Support Availability to ICT Integration

Regarding the availability of training and faculty support to ICT integration into EFL context, the EFL teachers were asked to specify whether their university district and staff provide adequate training to use technological resources and tools (pie-chart4.7).



Pie-Chart.4. 7.Training Availability to ICT Integration

Over half (55, 9%) of the participants reported a lack of attending such training opportunities, while 44, 1% of them acknowledged training availability. This contrast in the provided data is mainly related to teachers' interest in attending these training events. This latter, also provides considerable insights into the adequacy of such training sessions. It is worth noting that certain teachers may be unable to participate due to the unsuitable schedules of training sessions.

The number of respondents (44, 1 %) who assured their attendance to training occasions was further asked to identify the nature of training content. The responses of 7 items about the content of the attended training were distributed on the dichotomy of "Yes" and "No" choices (table4.3).

Statements	**Percent%**	
	Yes	**No**
1) I attended technology workshops, seminars, and sessions.	93,33	6,67
2) I participate in technology learning sessions at least once a month	33,33	66,67
3) I have been taught how to use many software applications	80,00	20,00
4) I have been taught how to design lessons using technology	93,33	6,67
5) I have been taught how to implement technology teaching pedagogies and methodologies	80,00	20,00
6) An educator model was brought to demonstrate how to use a specific software application.	26,67	73,33
7) I have been given time to practise what is learned during training sessions	33,33	66,67

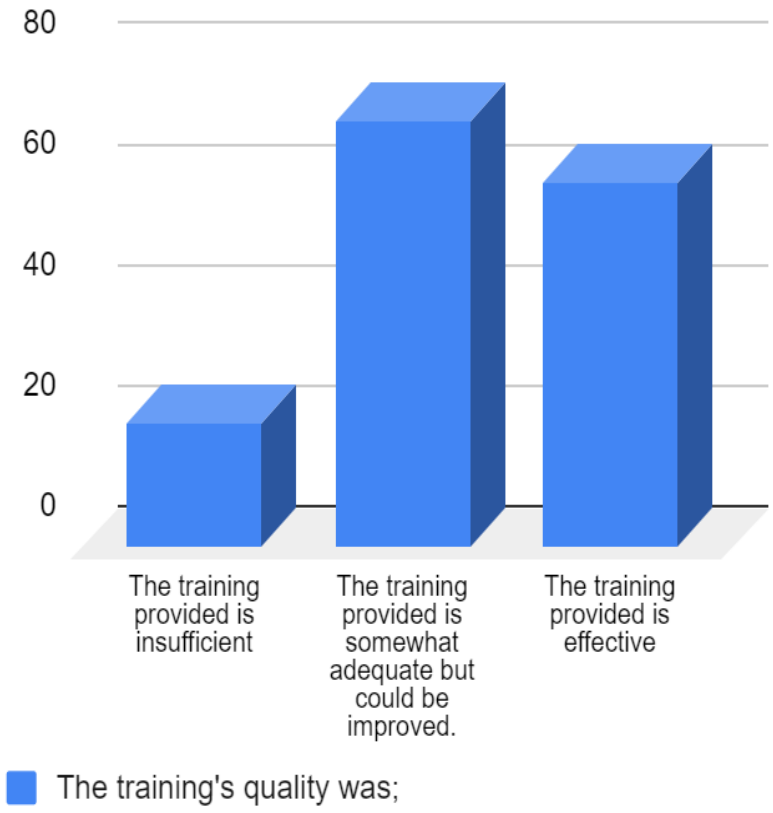
Table.4. 3.ICT Training Courses' Content

As it can be seen in table.4.3, almost all of the respondents who confirmed their participation (93, 33%) reported that they attended technology workshops, seminars, and sessions. For those who participated once a week in these training sessions, 33, 33% were found. Moving further, 66, 67% revealed their infrequent attendance. 80, 00% of the

informants confirmed that they were taught how to use many software applications. To design lessons using technology, 93, 33% of the respondents acknowledged this latter. As for the implementation of technology teaching pedagogies and methodologies; 80, 00% indicated that they received training about how to implement it.

In terms of having an educator model to demonstrate how to use a specific software application, the majority of the participants (73, 33%) reported that they did not have an opportunity to such experience. Furthermore, these respondents were asked whether they have been given time to practise what is learned during training sessions, almost two-thirds of the participants (66, 67%) indicated their lack of exposure to such training. These findings reveal that the provided training was based on theoretical concepts rather than focusing on real-life use and examples.

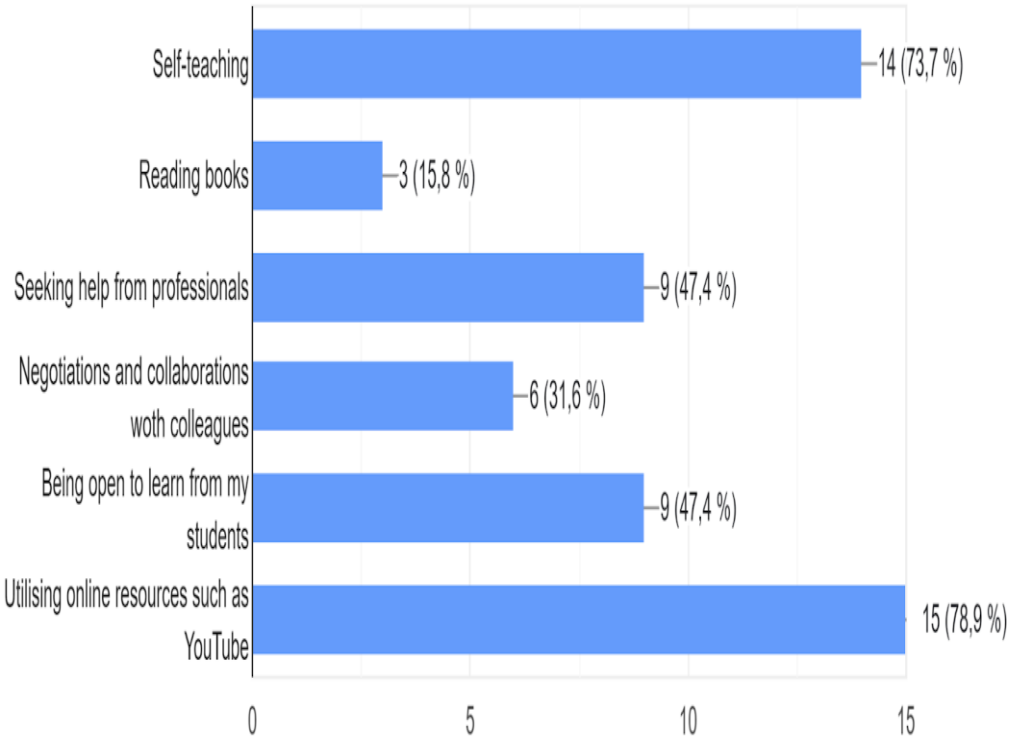
For gathering deeper insights, those respondents (44, 1 %) who assured their attendance in training sessions were also asked to specify the adequacy and quality of that ICT training provided by the university (bar-graph4.3).



Bar-Graph.4. 3.Quality of ICT Training

From the Bar-Graph.4.3 above we can notice that most of the respondents (46, 7%) reported that the training provided was somewhat adequate but could be improved. For 13, 3% of them it was insufficient. In contrast, 40, 00% of the participants indicated that the instructed training sessions were effective. These data reveal that teachers' satisfaction about ICT training content differs in regard to their pre-requisites and needs. Teachers' level of ICT knowledge varies; therefore, one lesson cannot fit for all.

On the other hand, for deeper insights the participants (55, 9%) who indicated a lack of ICT training opportunities, they were asked to state how they learned about ICT use with multiple choices from 6-items as illustrated in bar-graph4.4.



Bar-Graph.4. 4.EFL teachers' Ways to Learn about ICTs and their Implementation into their Teaching Practices

As can be observed in bar-graph4.4, the data illustrates that 73, 7% of the informants revealed that they rely on themselves to learn about ICT use. 78, 9% of them stated that they use online resources such as YouTube. 47, 4% of them indicated that they seek help

from professionals. Equally, 47, 4% of the respondents mentioned that they are open to learn from their students. 31, 6% of them have negotiations and collaborations with colleagues. These results demonstrate teachers' favourableness to ICT incorporation. Despite the lack of training and assistance, they are constantly looking for a way to know about the use of such technological tools and resources into teaching.

4.2.4. EFL Teachers' Perceived Usefulness (PU) towards ICTs

Thirteen statements were address to the participants to investigate their attitudes towards the educational attributes of ICTs. These items were designed to examine EFL teachers' perceptions of the relative advantage of ICTs, their compatibility with teachers' teaching situations' requirements and practices, and observability which covers how visible outcomes this innovation has. The table (4.4) demonstrates the frequency of EFL teachers' responses to the 13-items PU scale. EFL teachers' PU was presented by percents on a 5-point scale ranging from strongly disagree (SD) to strongly agree (SA).

Statement *I belief that the use of educational ICTs*	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1) increase the quality of learning and teaching	5,88	/	/	41,18	52,94
2) Facilitates teachers' work	5,88	/	5,88	35,29	52,94
3) Make learning/teaching enjoyable and stimulating	5,88	2,94	8,82	29,41	52,94
4) Afford multiple course content resources	8,82	/	5,88	32,35	52,94
5) Support teachers' creativity and productivity	5,88	5,88	2,94	32,35	52,94
6) Are useful instructional aids to address students' needs and concerns	5,88	2,94	8,82	35,29	47,06
7) Improve students' achievements and performances	5,88	5,88	14,71	38,24	35,29
8) Increases teacher-teacher, teacher-student, and student-student communication, involvement and engagement	5,88	2,94	17,65	32,35	41,18

9) Underestimate the role of the teacher	38,24	29,41	14,71	11,76	5,88
10) Using technological devices in my classroom will only mean more work to me	17,65	38,24	14,71	17,65	11,76
11) Minimise students' interest in face-to-face classes	20,59	38,24	14,71	20,59	5,88
12) Reduce face-to-face classroom interaction	17,65	41,18	11,76	26,47	2,94
13) The use of technology is time and effort consuming	8,82	35,29	2,94	35,29	17,65

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4. 4.the Frequency of Percentages of Teachers' PU towards ICTs

Table4.4 demonstrates that over half of the respondents strongly agreed (52, 94%;) and 41, 18% of them agreed that the use of ICTs increases the quality of learning and teaching. The majority of them (88, 23%) agreed with the statement that ICT facilitates teachers' work. 85, 29% of them acknowledged that ICT affords multiple course content resources, and for 82, 35% of them it makes learning/teaching enjoyable and stimulating. In terms of supporting teachers' creativity and productivity, 85, 29% were found. 73, 53% of the respondents believed that ICT improves students' achievements and performance. In similar vein, 73, 53% of them shared the view that ICT increases teacher-teacher, teacher-student, and student-student communication, involvement and engagement. Moreover, Respondents respond most favourably to item (6). 47, 06% of them strongly agreed and 35, 29% agreed that ICTs are useful instructional aides to address students' needs and concerns.

In response to the other 5 items (9-13) about ICTs attributes, the majority of the participants (67, 65%) strongly disagreed and disagreed with the statement that ICT usage underestimate the role of the teacher. Over half the informants (55, 89%) had disagreed with the view that using technological devices in their classroom will only mean more work to them. In similar vein, 58, 83% of them denied that ICTs minimises students' interest in face-to-face classroom classes. Equally, 58, 83% of them strongly disagreed and disagreed that ICTs reduce face-to-face classroom interaction. Surprisingly, over half (52,

94%) of the respondents strongly agreed and agreed that the use of technology is time and effort consuming.

The results have indicated that teachers have positive attitudes towards ICTs because they have enough knowledge about their characteristics and attributes. However, they are aware of the fact that technology adoption is time and efforts demanding. Thus, the presented data revealed that there is a strong positive association between teachers' attitudes and ICTs attributes of relative advantage, compatibility, and observability; that is their Perceived of Usefulness (PU).

4.2.5. Teachers' Perceived Ease of Usefulness (PEoU) towards ICTs

Participants were asked to respond to eleven statements regarding their perceived ease of usefulness towards ICTs to reflect their level of ICT knowledge and expertise. These items were designed to explore teachers' perceptions of: a) the complexity of ICTs; how easy or complex to use them, and b) the trialablility of these technological tools and resources. The table (4.5) demonstrates the frequency of EFL teachers' responses to the 11-items PEoU scale. Additionally, teachers' PEoU was presented as percentages on a 5-point scale ranging from strongly disagree (SD) to strongly agree (SA).

Statement	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1. I have the basic Computer Literacies and skills	2,94	/	5,88	70,59	20,59
2. I have the basic software skills	2,94	2,94	5,88	64,71	23,53
3. I have sufficient knowledge about how to use computers and other devices in classrooms	/	5,88	8,82	55,88	29,41
4. I know how to use web applications and share them with students	/	/	14,71	55,88	29,41
5. I know how to adopt and adapt the appropriate technological learning tool to the content of a given course	2,94	/	20,59	44,12	32,35
6. I know when to use them	/	/	11,76	50,00	38,24

7. I know how to solve technical problems	2,94	14,71	29,41	32,35	20,59
8. Technological tools were difficult to use or understand	20,59	38,24	14,71	17,65	8,82
9. The use of technological applications makes me anxious	29,41	29,41	26,47	11,76	2,94
10. Working with computers frustrates me	44,12	35,29	5,88	11,76	2,94
11. I feel anxious if something goes wrong when I am using any technological tool	29,41	14,71	11,76	32,35	11,76

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4. 5.Percentage Distribution of Teachers' PEoU towards ICTs

As can be observed in table4.5, data illustrates that almost all the participants (91, 18%) strongly agreed and agreed that they have the basic Computer Literacies and skills. 88, 24% of them reported that they have the basic software skills. 85, 29% of them showed an agreement that they have sufficient knowledge about how to use computers and other devices in classrooms. 85, 29% of them indicated that they know how to use web applications and share them with students and 76, 44% of them know how to adopt and adapt the appropriate technological learning tool to the content of a given course. Also, 88, 24% of them know when to use them. Regarding having the competence to solve technical problems, over half (52, 94%) of the respondents had an agreement.

Turning to the idea that technological tools were difficult to use or understand, over half (58, 83 %) of the informants showed disagreement. Equally, 58, 82 % of them strongly disagreed and disagreed that the use of technological applications makes them anxious. In similar lines of analysis, 79, 41% of the participants indicated that working with computers does not frustrate them. Equal rates of percentages in participants responses who (44, 12 %) disagreed and (44, 11%) who agreed whether they feel anxious or not if something goes wrong when they are using any technological tool. Overall, participants responded most favourably to the first 6 items and least favourably to item 11. These findings indicate that there is a strong positive relationship between teachers' attitudes towards ICT use in EFL and their perceived ease of usefulness (PEoU) that is their perceptions of the complexity of ICTs.

4.2.6. Covid-19 as a Social Influence and Pressure to Impact EFL Teachers' Attitudes

In this section, Responses to nine items were distributed on "Strongly disagree, "disagree", "neither", "agree", and "strongly agree" options. The aim of these items was to investigate how Covid-19 has influenced teachers' attitudes and behaviours. The practical part of this research work coincided with the onset of the global pandemic; hence, the influence of Covid-19 as a social pressure on teachers' attitudes cannot be neglected. The 9 items were found to measure the extent to which this outbreak encourage or discourage EFL teachers to embrace the innovative teaching pedagogies and technologies to conform to the new social norms. Tables 4.5-6 present the distribution of the percentages of EFL teachers' level of agreement or disagreement.

4.2.7. Before and during Covid-19 Pandemic

These first two items aim to measure teachers' level of agreement towards ICT incorporation prior to Covid-19 (Table4.6).

Statement *Prior to Covid-19……..*	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1) I was able to manage and use ICTs	5,88	/	14,71	64,71	14,71
2) I had positive attitudes towards these educational technologies	5,88	2,94	14,71	47,06	29,41

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4. 6.Percentage Distribution of Teachers' Use and Attitudes towards ICTs Prior to Covid-19

Table4.6 presents that the great majority of the respondents were at the agreement side. Prior to Covid-19, the majority of those (79, 42 %) who responded to item 1 indicated that they strongly agreed and agreed that they were able to manage and use ICTs. 76, 41% exhibited favourable positive attitudes towards these educational technologies.

Moving further, knowing about teachers' level of favourableness during Covid-19 is presented in table4.7. 7 items were distributed also on scale of 5-points; ranging from strongly disagree to strongly agree.

Statement *During COVID-19……..*	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1. It was easy for me to use online learning applications	/	11,76	17,65	50,00	20,59
2. We were forced to use these educational technologies	2,94	/	5,88	64,71	26,47
3. I was able to manage online discussions and students engagements	2,94	2,94	26,47	47,06	20,59
4. I was able to prepare interactive activities and engaging e-content	5,88	5,88	26,47	35,29	26,47
5. I was unable to choose the appropriate technological tool for my classroom (platform)	14,71	35,29	20,59	20,59	8,82
6. I was unable to manage, prepare and design online courses	11,76	50,00	11,76	20,59	5,88
7. I used only ready-made programs	20,59	41,18	8,82	26,47	2,94

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4. 7. Percentage Distribution of Teachers' Use and Attitudes towards ICTs during Covid-19

The data displayed in table4.6, highlights a prevailing trend of agreement among the respondents. In response to item 1, 70, 59 % of the participants showed strong agreement and agreement in their ability to use effectively the online learning applications during the unprecedented situation of Covid-19. Similarly, 70, 59 % of them strongly agreed and agreed that they were forced to use these educational technologies due to the total educational closure since there was an urgent need for a total transformation from face-to-face traditional way of education to fully online mode of learning. 67, 65% of them

indicated they had the capacity to manage online discussions and students' engagements. In terms of preparing interactive activities and engaging e-content, 61, 76% of the participants expressed strong agreement and agreement.

The majority of the respondents responded least favourably to the negative statements (5-6), expressing disagreement. Half of the participants did not agree about being unable to choose the appropriate technological tool for their classroom. 61, 76% of them did not concur with being incapable to manage, prepare and design online courses. 61, 77% of the informants strongly disagreed and disagreed to use only ready-made programs. From the displayed data, it can be understood that the Covid-19 outbreak was an unplanned training for ICT usage. All the teachers had no choice, but to use technology.

4.2.8. Post Covid-19 and Intention of Continuous Use of ICT

Concerning EFL teachers' opinions about the use of ICTs in post Covid-19 and their future intention of use, the responses to 3 items clustered on the categories of strongly disagree, disagree, neutral, agree, and strongly disagree (table4.7).

Statement	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1- The use of ICTs increased my knowledge of pedagogies and content	/	2,94	8,82	52,94	32,35
2- The use of ICTs improves my performance in teaching	2,94	/	14,71	58,82	23,53
3- I intend to continue using digital tools of learning in my teaching	2,94	/	8,82	38,24	50,00

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4.7. Percentage Distribution of Teachers' Intentions of ICTs' Continuous use in Post Covid-19

Table4.7 depicts that almost all the responses were at the agreement side. The majority of the respondents expressed strong agreement and agreement in their intention for future ICT use. 85, 29% of them revealed high inclination towards the use of ICTs because they

believe that using such technologies in a period of a total closure increased their knowledge of pedagogies and content. 82, 35% of the participants strongly agreed and agreed that ICTs' usage improved their performance in teaching. Hence, the great majority of the participants (82, 35%) showed high level of inclination to continue using digital tools of learning in their teaching. The results showed that Covid-19 period has pushed teachers to be ICT literate and to be able to operate technology-driven equipment and applications.

4.2.9. ICT Training: Teachers' Perceptions and Beliefs

In addition to the affordances of ICT training listed in the questionnaire, EFL teachers were asked about their perceptions and beliefs towards ICT training. Responses to 5-items were distributed on a scale of 5-points ranging from "strongly disagree to strongly agree".

Statement	**Percent%**				
	SD	**D**	**N**	**A**	**SA**
1- Knowing how to use ICTs is a worthwhile skill	/	/	5,88	20,59	73,53
2- I would like to increase my skills with computers and software.	/	/	/	32,35	67,65
3- I believe that training fosters teacher's ability to use technology in teaching/learning	/	/	5,88	23,53	70,59
4- I would like more opportunities to observe other teachers using technology	/	/	5,88	35,29	58,82
5- I would like to attend more training workshops and seminars about technology integration in teaching/learning	/	/	2,94	23,53	73,53

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Note: * polarity reversed on these items

Table.4. 8.Percentage Distribution of Teachers' Perceptions and Beliefs of ICT Training

Table4.8 demonstrates that a predominant proportion of the EFL teachers exhibited high favourable responses towards the five ICT training-related items. In fact, no strong disagreement or disagreement was revealed by the participants. Almost all the participant (94, 12%) perceive knowing how to use ICTs is a worthwhile skill. All of them (100%)

indicated that they like to increase their skills with computers and software. 94, 12% of them strongly believed that ICT training fosters teacher's ability to use technology in teaching/learning. Therefore, the majority of the respndents (94, 12%) would like more opportunities to observe other teachers using technology. In addition, almost all (97, 06%) of them expressed high agreement to attend more training workshops and seminars about technology integration in teaching/learning. This means that teachers' have the highest positive attitudes towards training. At the same time, these responses demonstrate EFL teachers' need for more training to experiment the available ICTs and keep up-to-date with the constant educational change. Taken together, these findings assert that institutional training and support is very important to foster digital learning technologies inclusion and adoption.

To consolidate the collected data, the questionnaire included open-ended questions. The respondents were asked to suggest what training opportunities should be provided for teachers to integrate technology effectively. In this regard, responses revealed that the respondents acknowledged that *"Any kind of training is of great value; workshops, training sessions by a colleague who is good in Technology, sometimes even informal discussions with colleagues or even students may give useful hints."*. In similar words, the participants believed that *"Teachers should be provided with training opportunities during all the academic year, with at least one opportunity per year to strengthen their technology related skills in foreign countries where technology is already strongly integrated"* and *"They should be provided with opportunities to visit international institutions wherein they can learn about the latest trends of technology use"*. In addition to, *"Providing workshops and a well designed program for teachers to learn how to manage with the new technological devices"*. For them it is necessary that educational institutions should *"Provide internet in the classrooms. - provide more technological equipments like computers and interactive boards, build site to house class content, encourage skills practice, research, and more collaborative activities. Use more platforms like MOODLE in teaching, and use technology for feedback and assessment"*. They contended that *"Training should be based on the teacher's teaching needs. To demonstrate with, teacher needs to learn when, what and where these technological aids are to be used"* I.e., they need *"Practical training (with some theoretical knowledge)"*.

In summary, the above mentioned comments summarised well teachers' attitudes towards ICT training and ICT incorporation in general. Their emphasis on the necessity of ICT training explains their strong appreciation and favourableness to technology adoption in their teaching practices. Their comments cast light on their requirements for incorporating digital learning/teaching tools and resources.

4.3.Semi-Structured Interview Analysis

The qualitative data were pivotal not only to corroborate the finding from the survey questionnaire of the study but as well as to uncover some issues that explain teachers' attitudes towards the use of ICTs, their teaching practices. Also they were found to explain how well EFL students as future teachers are prepared to incorporate technology in EFL and show the role of ICT training in implementing appropriately those educational technologies. The qualitative data analysis yielded key findings that can be presented in the following themes: a) students perception towards ICT in EFL, b) teachers' use of technology, c) the availability of a module of ICT and the adequacy of its courses. These themes merged as significant aspects based on the analysis of qualitative data and are presented and organised in relation to research questions. Precisely, these findings are related to research question 4 and help explain research questions 3, 5, and 6 (the relationship between teachers' attitudes, their use of educational technology, students' training of ICT use and development of digital competence).

4.3.1. EFL Students' Profile

Regarding the EFL students who participated in the interview, they were 1st year master students of Didactics. Most of them (66, 7 %) were female and (33, 3%) of them were male within the 21-24 age range.

4.3.2. Students' Perception towards ICT Use in EFL

The qualitative data provide key cues in understanding students' characteristics and perceptions towards the use of technology in EFL. Interviews helped better explain students' needs and preferences and the extent to which they are aware of the importance of technology use in language teaching and learning. Results revealed that technology use improves students' learning experiences and the construction of their knowledge as well as their skills. In this vein, informants believed that ICT is *"a powerful and transformative*

tool that enhances access, engagement, and personalized learning opportunities". It is *"Enjoyable and achievable"*. For them, *"It is so helpful for both the teacher and its learners as it facilitate teaching and learning and make a flexible atmosphere".* One of the informants believed that *"learning and teaching with technology is an important matter for this generation."*. In this regard, *"the Implementation of technology in teaching English may lead to better and successful language learning"*, *"It facilitates learning and it is helpful for the shy students"*, and *"It has an effective way to provide the knowledge required including exercises about grammar and vocabulary".*

For the respondents, *«Technology helps students to do assignments quickly and it opens up spaces to construct knowledge and motivates to do further research; especially when students find resources easily and with no costs"*

Based on the above mentioned results, all of the participants shared positive attitudes towards the use of technology in EFL context. They considered technology as a valuable tool that enhances the availability and accessibility of digital resources such as dictionary applications and grammar-checking sites. They also believed that the use of technology allows them to improve their language skills. Overall, the findings indicated that EFL students use technology because they find it engaging and make them actively involved in the learning process.

4.3.3. EFL Teachers' Actual Use of Technology

To understand better teachers' attitudes towards the use of ICT, and how these attitudes manifest in their classroom practices and teaching in general, the researcher asked the students about the titles and content that they dealt with in TEFL module. All the participants highlighted the following titles: Didactics vs pedagogy; Blooms Taxonomy; classroom management, theories, approaches, and methods of learning and teaching; together with evaluation and assessment. All the informants did not report any title specific to the use of technology in EFL. Besides, when participants were asked about whether their teacher of TEFL have ever told them about how to teach through technology use, all of them said no.

In the next question the respondents were asked about the titles they studied pertained to technology-enhanced language learning and teaching approaches. The reported findings

indicated that all the participants did not tackle this subject in particular as an independent topic. Responses such as "direct method", "we did not tackle that", "no idea", "Competency-Based Approach (CBA), Grammar-Translation Method (GTM), and Humanistic Approach", and "lesson planning" were the main comments to this question.

To better understand teachers' practices, participants were asked whether they attend online courses with their teachers and if their teachers offer support to design lessons subject to the new teaching/learning paradigms through technology integration. The majority of the respondents said no. To some interviewees the use of technology included the use of emails, only when needed for assignments or to ask about exams.

Besides, the majority of the subjects reported that they have an idea about how to teach via technology. From one hand, this asserts that today's learners are technocrats. They are growing adopting and adapting their environment patterns. On the other hand, this explains as well learners' lack of knowledge regarding technology use in EFL because the use of educational technologies is not only subject to the use of computer, overhead projector, or online applications. Hence, the researcher of the present study sets a raff of questions to investigate the extent to which these students; as future teachers, are trained to integrate ICT.

4.3.4. The Availability of ICT Module and the Adequacy of Course Content

Interviews were of great contribution to cast focus on the availability of ICT training as a Module and the extent to which students are prepared and trained to make better use of educational technologies. Participants were asked if they have a module of ICT. All of them said yes; however, two of them reported that they did not attend because of timing inadequacy. All sessions were at 8 am which was hard for them to be present at.

For deeper understanding, the researcher provided the respondents with 13 items of "Yes" or "No" choice to measure ICT course content adequacy. The majority of the participants (13) agreed that the ICT teacher taught them about how to use Excel, make PowerPoint presentations, store data, and how to make use of the options found in Microsoft Word. 7 subjects stated that in the module of ICT they dealt with how to use and connect through Email. 8 participants declared that they studied how to use websites and

search online for information. Similarly, 8 informants reported that their teacher gave them some examples about the available online learning applications and platforms.

On the other hand, 8 respondents stated that they did not deal with how to participate in an online course. A great number of the participants (11) stated that their teacher of ICT did not explain to them how to apply the new educational technologies into EFL context. Nonetheless, they assert that they received no explanation regarding technology-enhanced language teaching/learning approaches. As a last point, 10 participants affirmed that they had no chance to design a course using technology. This difference in participants' answers in the checklist of 13 items is justified by their absence for the already mentioned reason.

Next, the investigator asked the participants if the items that they dealt with in ICT module were theoretical or practical. All the interviewees affirmed that the sessions were theoretical rather than real-world application. It is worth noting that theoretical training can provide deep understanding and solid foundation to understand concepts and principals of ICT; from basic to more complex skills. However, it cannot be sufficient alone, theory must be complied with practical training; giving opportunities for experimentation.

Moving further, the researcher asked the students if their teacher of TEFL asked them to make presentations or plan lessons via technology. Out of the total of 15 participants, 8 responded negatively stating that their teacher was focusing more on learning theories, methods and approaches. They rely on the use of papers or boards to present their projects using the traditional way. The remaining 7 participants declared "Yes" but specifying that it was their initiations to use technological tools to present projects. One interviewee noted that "*before I present my project I go and ask the teacher if possible to use overhead projector and make a PowerPoint presentation*". Seeking permission to use ICT reflects EFL students' positive attitudes and their level of ICT knowledge.

In summary, interviews were very useful to shed light on student teachers' perceptions towards the use of ICT and EFL teachers' practices. Qualitative data inserted new dimension to the quantitative data by providing insights to teachers' attitudes and the factors that influence those attitudes such as ICT module availability and course content adequacy. Qualitative findings illustrated the role that ICT training can have to the uptake of ICT in EFL context.

4.4.Discussion of the Findings

The quantitative findings of this study indicated that, despite the limitations that the interviewees reported regarding the use of ICT in the English department at Tiaret University, teachers generally exhibited positive and attitudes towards ICT inclusion into EFL teaching and learning. The subsequent sub-sections offer comprehensive insights into the factors and pre-identified independent variables influence EFL teachers' attitudes towards the use of ICTs into EFL context. Based on a quantitative descriptive and qualitative content analysis of the collected data, these findings are interpreted. Observation of the differences in percentage distributions is commonly used to examine the strength of association between the independent variables (ICT competence, PU, PEoU, Social pressure (Covid-19), and ICT training) and dependent variable (EFL teachers' attitudes) and to estimate hypotheses and answer research questions.

4.4.1. Research Question One: Teachers' Actual Use of ICTs and Possible Factors Influencing their Attitudes: University Equipment, Internet Accessibility, and Technical Support Availability

Today, the world is e-permeated. Every aspect of society and human practices are influenced by electronic facilities and technologies. One of these aspects is education which is adopting digital learning technologies and shifting towards constructivist student-centred learning and teaching approaches. Developments and changes in technology have influenced learners' and teachers' uses and reflected their purposes of use. The majority of the participants in the current study, who were EFL teachers in the English department, demonstrated that they moderately use digital learning technologies in curriculum preparation and designing online learning activities that require their students to work online. They identified their ICT use as frequent to occasional. On the other hand, findings indicated that teachers have constant use of ICT limited to the use of over-head projector, computer use, PowerPoint presentations and in lesson plan together with in searching about courses' content and materials. Regarding technological appliances' access, over half of the participants acknowledged their accessibility to such technological. In similar vein, a majority of the participants indicated a lack of Internet availability and if it is found, it is of poor quality.

In the process of investigating teachers' attitudes and their actual use of ICTs, teachers acknowledged their engagement in online platforms to conduct online courses with their students; however, they admitted a low rate of frequent involvement. The majority of the participants are engaged in these platforms for specific purpose of accomplishing assignments rather than considering this process as a modern mode of teaching/learning. The difference in EFL teachers' responses to the frequency they get connected online with their students can be attributed to a range of factors; including the nature of their subject specialty, their teaching practices, and the number of students' groups. Some teachers may assign paper-based assignments and oral presentations which are different form online engagement. Furthermore, teachers overseeing small number of groups may find online management more feasible. On the other hand, these disparities reflect the level of ICT proficiency and the underlying motives for technology incorporating in their teaching practices.

Despite the scarcity of technical support that is received only when necessary, a majority of the EFL teachers reported occasional occurrence of discussion among them regarding ICT use and its educational benefits. This shows a significant consensus among university EFL teachers emphasising the need to technology implantation into EFL education and demonstrates teachers' acceptance of the integration of technology into EFL context. These findings concur with the view of Chen (2008) who explained that teachers need to negotiate and share new ideas, experiences and knowledge among each other to gain precious opportunities to expand their knowledge and try new innovative pedagogies especially from those who are experts for the sake of reinforcing their skills, so that they fit to and respond effectively to innovative developments in their domains.

To show the importance of constant discussion to the integration of ICT, Abuhmaid (2011) puts it that collaboration, teamwork and communication are the emerging aspects and skills of today's dynamic world, obviously, self-contained culture of instructional milieus hampers teachers to perform better in those environments. Traditional isolation constrains teachers to share experiences and learn about how to embody ICT in pedagogy as well as it is the enemy of meeting the constantly changing needs of learners (Fiszer, 2004). When schools' culture is remodelled, teachers can learn better in these learning environments.

With respect to the first research question, the findings demonstrate that the majority of the EFL teachers exhibited positive attitudes towards ICTs; however, lack of ICT equipment, technical support, and internet connectivity were among the influencing factors of technology adoption into EFL teaching and learning. A shortage of materials, limited access to internet, lack of teachers' technical support and time; administrative work load, and more, were among the reasons that led to the limited use of educational technologies. These results are consistent with the findings of the previous research works on ICT integration, including Rababah (2012); in his work EFL Teachers' Barriers to the Use of ICT in Instruction in Jordan, who cited many authors and previous studies which classified the factors that inhibit the embodiment of ICTs in EFL learning/teaching into extrinsic and intrinsic obstacles. Among them, Ertmer (1999) specified the extrinsic constrains to lack of time, support, resources and training. On the other hand, the intrinsic ones encompasses: attitudes, beliefs, practices and resistance to change. Ertmer mentioned other interferences that make the use of ICT impossible including organizational and pedagogical concerns, technical and logistical issues, and personal problems such as fear. In the same line, Plgrum (2001) had another division for such barriers by splitting them up into material and non-material. The first one covers the absence of physical equipment; however, the second referrers to knowledge, confidence and time absenteeism. Moving to Omani higher education, Al-Senaidi et al (2008) pointed out that lack of time and intuitional reinforcement as the most considerable hurdles to impede ICT educational infusion.

Further, comments provided by the interviewed students concur with the findings that describe teachers' actual use of ICT into their teaching practices. These students indicated that they receive no training about technology pedagogy as future-teachers. Their teachers have limited use of technological tools and resources, submitting assignments via emails or posting exams schedules are the main purposes for ICT use. A theme that emerged from discussing these findings is that this disparity has indicated that the implementation of ICT into EFL teaching/learning is still at an initial stage. Teachers' level of ICT knowledge is at a low level. They have positive attitudes and show the intention to use technology but their use is limited to basic technology uses, including using over-head projector, asking students to make PowerPoint presentations, and submitting assignments via email. Considerably, these findings concur with the view held by Cachia et al. (2010:3) who declared that "Research indicates that technology's use in the classroom can have an

additional positive influence on student learning when the learning goals are clearly articulated prior to the technology's use". The integration of ICT in education might be seemed easy; however, its effective use in teaching and learning process is complex and multifaceted process (Semerci & Aydin, 2018). Overall, a possible explanation for teachers' positive attitudes and the high reception of ICTs among them is mainly to due to teachers' high expectancy that they maintained towards ICTs' educational significance and affordances into EFL teaching and learning. This confirms the first hypothesis that "University EFL teachers are expected to have positive attitudes towards ICTs incorporation in EFL due to the educational affordances offered by digital technologies".

To understand better the attitudes that EFL teachers' hold towards ICT, the following sub-sections sketches the contribution of the information about the factors that affect teachers' ICT use and their association in forming teachers' attitudes through the lenses of three notable innovation adoption theories; Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT), and Technology Acceptance Model (TAM), presented in the literature review as the theoretical framework of the current study.

4.4.2. Research Question Two: Teachers Attitudes and ICT Perceived Usefulness (ICT Attributes)

Teachers' attitudes towards the use of ICTs were investigated from lens of the aforementioned theories which agreed on that the acceptance or rejection of new technology is subject to the attributes that this technology itself possesses. According to, Ajzen (1993) attitudes towards a behaviour (technology adoption) are pertained to the evaluative disposition of favourableness and unfavourableness to the behaviour in question that is how positively or negatively an individual views the outcomes of performing a behaviour or using a given system. In a similar fashion, Rogers (1995) viewed technology acceptance is largely subject to technology attributes that he categories as; relative advantage, compatibility, trialability, observability, and complexity. The last attribute will be investigated in the next section. In the same vein of thoughts, Davis (1989) contend that individual' s expectancy performance predicts their technology acceptance that is the degree to which they believe that using a particular system would enhance his or her job performance. Across all the theories, the researcher examined teachers' attitudes in response to their perceptions of the attributes of ICTs.

Results indicated that EFL teachers' had high favourable evaluative judgements. The majority of the participants perceive the use of ICTs as useful and increases the quality of teaching and learning and facilitates teachers' work. Additionally, it enhances communication and engagement. Teachers' perceptions of ICT relative advantage are extremely high. These findings concur with comments provided by Pitler et al. (2007: 1) pointing out that "with technology standards becoming an integral part of students' education, teachers are more enthusiastic than ever to learn new technologies and methods". For Ajzen (1993), assessment or judgments of willingness of performing a given behaviour is the strongest predictor of an individuals' intention to use a new system of innovation

Moreover, the majority of the respondents perceive ICT as compatible to their teaching requirements and their students' needs. Teachers' responses indicate high towards educational technologies because they afford multiple courses' content resources, generate stimulating and enjoyable learning, facilitate addressing students' necessities and concerns, and boost their educational performances and achievements. These findings assert the observability of ICT use and the visible outcomes these innovations provide to EFL teaching and learning. They also align with Prinzessinnada' s (2013) statements that the use of ICTs becomes widely accepted among teachers especially those of EFL for the purpose of elevating learners' understanding and comprehension of the Target language.

As the case for the previous attributes, relative advantage, and observability, EFL teachers' perceptions of ICTs' trialability are high because the majority of them believe that the use of technological devices in their classroom does not mean more work. However, teachers' responses are inconsistent ranged between agree and disagree in terms of time and effort consumptions. The variance between ICT Perceived Usefulness and demands of their integration with regard to existing hindrances; demonstrates that technology use is not only about disposing positive attitudes or fashion use; however, technology incorporation is a long process. Precisely, these attitudes affect and are affected by many patterns. As stated by Fenstermacher (1994) classroom action and practices are governed by the knowledge learnt; in an agreement with Garavan (1997: 48), stating that "employees are being asked to do more in less time and many are required to acquire totally new competences".

Considerably, this study found that teachers are aware of the potentials and challenges of using ICT into teaching and learning practices. These findings elucidate that teachers' attitudes are strongly associated with their Perceived Usefulness and practical implications. These results imply that teachers' acquaintance with ICTs' attributes correlate with their adoption decision-making. Eventually, it can be argued that the process of ICT integration; where teachers occupy a decisive role, is intricate. Technology-based reforms are multifaceted endeavour which needs huge efforts to attain the full pedagogical potentials of ICT. Regarding this complexity, technological and pedagogical competences are highly required to make appropriate use of these technological resources either with the students or for personal-professional uses.

4.4.3. Research Question Two: Teachers Attitudes and ICT Competence and PEoU

Whether named as perceived behavioural control in Ajzen' s (1993) TPB, complexity in Rogers' s (1995) DIT or perceived ease of use (PEoU) in Davis (1986) theory, all terms refer to individual's perception to the degree of difficulty or ease of performing the behaviour of interest. With regard to, findings from the present study showed that teachers' responses on PEoU scale demonstrate that the majority of the teachers had high level of competence regarding basic computer skills and software skills. They had moderate level of competence in terms of technological tools' and resources' selection, management, and organisation. Precisely, the findings provide insights on teachers' perception on the complexity of educational technologies. They indicate that a substantial percentage of teachers revealed that these digital resources were perceived as manageable rather than overly complex.

Results indicated that teachers have little competence at handling the situation when they are encountered with technical pitfalls. Most of them reported that they feel anxious when something goes wrong. To support these findings, results obtained from the interviews highlighted the modest use of technological devices, applications, and resources by their teachers. Despite their high perceptions and appreciation of ICTs, teachers' ICT usage is scant. In concurrence, Koehler and Mishra (2009:61) pointed out that digital technologies are "protean (usable in many different ways); unstable (rapidly changing);

and opaque (the inner workings are hidden from users)". By their very nature, ICTs present new challenges to teachers who are struggling to use more technology in their teaching.

Additionally, results indicated that teachers' use of ICT is still limited to basic skills of technology. Hence, technology adoption into teaching is not about a mere manipulation of computer and a number of software skills. In concurrence, Webb and Cox (2004: 5) claim that "the types of uses of ICT and the way it is used in lessons are influenced by teachers' knowledge about their own subject and how ICT relates to this". Similarly, Morellato (2014) points out that in the use of ICT, a complex and holistic proficiency is incorporated with pedagogical judgment in educational contexts, "this means that the focus is directed towards pedagogy and subject matter, while technical skills are only a part of this complex process" (p. 187).

Besides, these findings accord with Coppola's (2005) findings; cited in Suryani (2010), which summarise that the use of internet does not depend on "cosmetic use," "technological imperative," "romantic vision", or "technological competition." Cosmetic use of ICT is about when teachers feel trapped to use such devices even if they do not assume it as the suitable method or unnecessary for given lessons. Imperative technology covers the preconceived passionate idea about the use of ICT with no regard to its usefulness. The romantic vision when ICT is given superiority to technology than the teacher. Technological competition comes about when certain schools gain prominence due to use of up-to-date technology sometimes thoughtlessly; just a matter of fashion. In fact, ICTs can provide great assistance to facilitate the process of teaching and learning but may never replace the role of the teacher especially when these latter have a crucial relationship with their learners.

In this study ICT competence was a significant predictor of teachers' attitudes and attitude behaviour-correspondence. Teachers' acknowledged the importance and the usefulness of ICTs, but their lack of ICT knowledge hampers them from appropriate and constant use of ICT in their teaching practices. These findings confirmed the second hypothesis that: "Factors such as ICT competence, Perceived ease of use of ICTs, and perceived usefulness are expected to have positive impact on University EFL teachers' attitudes and decision regarding technology-adoption". Technology adoption is highly

governed with the beliefs, perceptions, the level of knowledge, and proficiency that teachers have towards a system of innovation.

4.4.4. Research Question Three: Teachers' Attitudes and Social Pressure (Covid-19)

ICTs have been cited as potential innovations integrated into EFL teaching and learning. This was observed-and, to a large extent during the pandemic when technological tools and digital learning becomes the new paradigm and heavenly relied on. However, this did not come without confronts and concerns. This study sheds light on pre-pandemic teachers' attitudes towards ICT use to analyse and understand how really attitudes shifted through time of health crisis in order to provide deep insights of the impacts of the global pandemic. As a result, teachers' preconceptions were not necessary all positive because the majority of the participants reported that they were forced to use ICT during Covid-19, but experiencing this new educational system and being under pressure positively altered their perceptions. The findings revealed a sense of an overall belief among the teachers in the feasibility of the use of digital learning technologies and a shift to the new learning modalities and environments. Attitudes are influenced by beliefs about attitude object. The results aligned with the assumption that attitudes are influenced individual's beliefs, emotional favourable reactions, and external impacts such as social and subjective norms (Ajzen, 1991; Haddock & Maio, 2007).

As viewed in TPB and DIT, subjective norms, social norms, and attitudes are interconnected. Subjective norms as a subset of social norms both refer to an individual's perception of social pressure (Covid-19) from important others (policy-makers, practitioners, stuff, and colleagues) regarding particular behaviour (ICT use during Covid-19). In this study, the results indicated that the majority of the participants share consensus on the usefulness of ICTs. As an educational community, they approved technology adoption even before Covid-19. Hence, during the pandemic, a predominate portion of the questioned EFL teachers accepted the use of ICTs and asserted their expectation of high performance outcomes and achievements via the use of these technologies. It can be stated that teachers; as a social network, approve ICT adoption and feel highly motivated to comply with these expectations.

The data revealed that the high agreement among the teachers showed that there was a shared perception regarding the usefulness of ICT use during Covid-19 which affects their future intention of further use in post Covid-19. Moreover, results highlighted that Covid-19 as an external factor had a significant influence on teachers' Perceived Usefulness and Perceived Ease of Usefulness. Dönmez and Karasulu Kavuncuoğlu (2019), cited in Kara and Ada (2021) indicated that "it is predicted that a teacher who exhibits a positive attitude toward their profession has a strong occupational resilience belief against difficult conditions" (p. 106). Acting like a driving force to use ICTs, an increased sense of control of use of operating technology-driven equipments and applications was noticed in addition to a boost in proficiency. These findings confirm the third hypothesis that "The Covid-19 pandemic is anticipated to increase EFL teachers' adaptability, ICT competencies, and e-readiness to use digital technologies and resources in teaching practices".

These findings indicate that influences of social systems and pressure have much effect on new system adoption which are largely consistent with TPB, DIT, and TAM advocates that high intentions, belief-based indices, PU, perceived control over the behaviour, and PEoU (owing to the improved ICT competence) propose a desirability to continued ICT usage. This concurs with Ajzen's (1991) claims that teachers' attitudes are widely influenced by social norms. Even if they have some reservations, they may adopt an innovation system since it is viewed as effective within a given community.

In summary, planned experiences which involve pre-designated and prescribed tasks or jobs, can be viewed as fundamental catalyst and 'test bed' for the skills, techniques, ideas, etc., acquired in formal training and educational settings from one hand. On the other hand, unplanned learning experiences can be another agent of knowledge, skills, and attitudes' acquisition as well as development. In such unexpected situations, individuals have to undergo a process of reflection to adapt what they learned earlier to build up a repertoire of fitting responses in the present learning experience and to handle future contingencies. Actually, new learning needs are set when individuals are unable to deal with unexpected learning situations. This deficit in performance requires future planned training. Needless to say, training programs need to be designed to meet individuals' job requirements and needs instead of being just a mere formality.

4.4.5. Research Question Four: Teachers' Attitudes and ICT Training

Regarding ICT training, EFL teachers' responses were inconsistent. Over half (55, 9%) of the questioned participants reported a scarcity of ICT training opportunities from one hand. On the other hand, 44, 1% of them acknowledged their attendance of training sessions. When this kind of division in teachers' responses occurs, it can be useful to step back, reflect, and consider the nature of this inconsistency. In fact, this indicates that the teachers have knowledge about the availability of ICT training but there were a number of hindrances, including inconvenient timing that training events do not align with schedules of all teachers, place, and format of training. Obviously, insights regarding ICT training adequacy can be derived from these results.

Most of the participants who assured their attendance acknowledged the inadequacy of ICT training programs and a lack of an ongoing training. Nonetheless, the majority of them showed a desire to improve the quality of the provided training opportunities. Teachers who reported that they did not attend ICT training sessions had a self-paced training. They relied on themselves, their students, colleagues, and other digital resources to learn about the use of ICTs. These findings concur with Koehler and Mishra (2009) advocates that social and contextual impacts can set hurdles to the relationships between teaching and technology. That is, institutional contexts do not support teachers' efforts to incorporate technology use into their teaching practices. Moreover, teachers have been often provided with inadequate training. "Many approaches to teachers' professional development offer a one size-fits-all approach to technology integration when, in fact, teachers operate in diverse contexts of teaching and learning" (Koehler & Mishra, 2009, p.62).

To understand better teachers' needs regarding ICT integration, they were asked about their perceptions and beliefs towards ICT training and to suggest additional requirements. The majority of the EFL teachers exhibited high favourable responses towards the five ICT training-related items. Almost all of them perceived ICT competence as a part of their professional competence especially with the huge spread of educational technologies. They indicated a necessity to improve their computer and software skills. This means that teachers have the highest positive attitudes towards ICT training and there is a strong correlation among teachers' attitudes and their ICT competence. At the same time these

responses highlighted teachers' needs for more training to experiment the available educational technologies and keep up-to-date with the constant educational advancement.

Furthermore, the obtained findings asserted that institutional training and support are very important to foster digital learning technologies inclusion and adoption. Teachers' responses to open-ended questionnaire's questions serve as an indicator for identifying teachers' needs for ICT incorporation. Evidently, needs analysis contributes to a great extent in designing adequate ICT training programmes and improving teachers' competences in using technological tools and resources for teaching (Syahid et al., 2019).

In similar lines of discussing the importance of ICT training, 1st year Master's degree EFL students were asked about the availability and adequacy of ICT module. Almost all of them acknowledged that they had such subject matter; however, the content of the courses does not include course design via technology, participation in online courses, practicing online applications, getting a large landscape about technology-enhanced language learning and teaching practices, and more. Additionally, results mentioned that the teachers of ICT covered basic points concerning digital learning technologies; including Microsoft Office application and basic online tasks. Therefore, many students are unable to make adequate use of ICTs in their learning activities and practices. They do not have an idea about their future pedagogical use as well. Coşkun (2011), cited in Kara and Ada (2021) pointed out that "the learning experiences of pre-service teachers should be arranged in a way to create positive attitudes towards the teaching profession" (p.107). At the same time, these findings describe the real understanding and ICT competence of teachers towards ICT use.

The quantitative and qualitative data indicated that the ICT training sessions were basic and ill-implemented; theoretical rather than real-world application. It is worth noting that theoretical training can provide deep understanding and solid foundation to understand concepts and principals of ICT; from basics to more complex skills; however, it is insufficient. Theory must be complied with practical training to provide opportunities for experimentation. For increasing the level of ICT knowledge, versatility and adoptability, extensive practice, support, positive feedback, and experiencing things are better than being told how to accomplish specific tasks, gradually, an expertise is developed to be shared later on with others (Overman, 1994; Buckley and Caple, 2009).

The above mentioned findings indicated that the availability and accessibility of adequate ICT training and assistance can significantly impact teachers' perceived ease of use, perceived behavioural control, and develop the level of ICT Competence. In addition, it has a great impact on teachers' professional development by enhancing their pedagogical skills, increase confidence, and improve their level of competence. This concurs with Sweeney's (2004) claims that trainees achieve intrinsic and extrinsic job satisfaction. When individuals become able to perform effectively a given task and work out a new repertoire of skills, they are intrinsically satisfied. Extrinsic satisfaction is due to the development in job's performance, the enhancement of career, and promotion prospects. ICT training helps teachers to be digitally literate and adequately employ the educational technologies in their teaching practices. Overall, these findings also confirm the fourth hypothesis that: "ICT training is predicted to play crucial role in enhancing EFL teachers' professional skills and content knowledge thereby improving their attitudes towards ICT integration in teaching". To wrap it up, training ameliorates staff performance (Brown, 1994), job satisfaction, productivity and profitability (Hughey and Mussnug, 1997). As a matter of course, training ensures the latest technical know-how and mechanical operations together with the empowerment of self-help groups.

4.5.Summary of the Main Findings from EFL Teachers' Questionnaire and EFL Students' Interviews

Employing mixed-methods research approach in the present study, quantitative and qualitative data were collected. The former was gathered through a questionnaire addressed to EFL teachers. The latter was collected through semi-structured interviews with EFL students. The questionnaire was pertained to investigate teachers' attitudes and related-behaviours regarding ICT use in EFL and the influencing factors of these attitudes, including ICT competence, Perceived Usefulness (PU), Perceived Ease of Usefulness (PEoU), Social Pressure, and ICT training. The interviews aimed to describe teachers' practices that reflect their attitudes and the extent to which they are preparing their students to be digitally competent as future-teachers.

The findings from EFL teachers' questionnaire revealed that the majority of them acknowledged the use of ICT in their teaching practices. 94, 12 % of them demonstrated predominantly positive attitudes towards the usefulness of these educational technologies

into EFL context. The positivity in their attitudes is associated with their perceived ease of usefulness. The majority of the teachers indicated that they possess the basic computer and software skills together with holding the sufficient knowledge to adopt and adapt appropriate educational technologies. Teachers held their positive attitudes even in unprecedented situation of the total educational closure caused by Covid-19. The majority (70, 59 %) of them showed an agreement of being able to use effectively the online learning applications and resources. Additionally, despite the majority of the participants reported a lack of technical support and a shortage in internet provision, they maintained positive attitudes towards ICT integration and 94, 12% of them showed high favourable inclination towards ICT training.

4.6.Conclusion

Results of the current research study are presented in this chapter. The findings of EFL teachers' questionnaire and EFL students' interviews were examined and analysed in relation to research questions and objectives. Descriptive statistics and content analysis were used as statistical techniques to drive meaningful conclusions from the data. The analysis of the respondents' responses indicated significant comprehension of teachers' attitudes towards technology adoption and the influencing factors of these attitudes. The obtained insights highlighted teachers' inclination towards technology adoption into their teaching practices. However, lack of university equipment, internet accessibility, teachers and students' low level of ICT competence are encountered as barriers. Additionally, the ill-implementation of ICT training programmes was indicated as a crucial factor for adequate educational use of these digital tools and resources. Results' analysis and interpretations in this chapter provide a foundation for insightful recommendations and conclusions in the next chapter.

Chapter Five: Recommendations and Conclusion

5.1. Introduction

From the research findings collected from EFL teachers' survey questionnaire and EFL students' semi-structured interview in relation to the theoretical framework presented in chapter 2. In addition to the understanding of the correlations among the concepts of ICT, teachers' attitudes, digital literacy and competence, as well as ICT training, it allows getting an overall idea about the reciprocal relationships among them all and how this overlaps would contribute in the effective implementation of technology in English language teaching/learning. Therefore, this chapter sketches the possible recommendations that improve teachers' actual of ICTs. It presents also recommendations subject to how teachers should use and implement digital technologies into Higher Education teaching practices.

5.2.EFL Teachers' Attitudes and Prerequisites for ICT integration

This piece of research can have an influence on the field of educational research related to educational technologies' implementation into education and EFL teaching/learning in particular. It can be said that despite the investments on ICT devices and its incorporation, teachers have low and initial use for technology as a pedagogical delivery system or integrate it in their curriculum. Though the Algerian Ministries of education have developed policies and devoted great efforts for incorporating ICTs in education, the results indicated that ICTs integration is conditioned by a number of factors such as a shortage of materials, no access to internet, lack of teachers' training and time; most of teachers are loaded with administrative stuffs and preparation, and more. These findings also serve as a useful indication of teachers' attitudes and attitude-related impacts.

Based on these results, it is paramount for teachers and policy-makers to understand such barriers and make initiative to overcome them and the assumption of technology can revolutionise education gains prominence at the cost of human side and justifies the early attempts of supplying schools and universities with computers and other technologies; as a matter of fact, large attention can be given to their best use.

5.2.1. Policy-Makers and ICT Integration into EFL Context

From the present study's research outcomes, multiple implications can be developed for policy-makers. They can also determine pathways for adequate learning and teaching

adaptations, making decisions to improving educational contexts and circumstances, as well as creating initiatives that enhance teachers in acquiring the necessary competences and skills for ICT integration.

As results indicated that despite the encountered limitations; teachers generally had high levels of favourableness towards ICT use. It is essential for policy-makers to maintain, sustain, and promote teachers' attitudes as a prerequisite for successful ICT integration. In the view of, teachers' low level of ICT competence, a lack of technological appliances, a lack of internet accessibility, and an absence or inadequacy of ICT training, policy-makers need to provide education institutions with adequate ICT infrastructure, technological appliances, and develop effective ICT training programs.

5.2.2. The Development of Adequate ICT Infrastructure and ICT Equipments' Availability

The majority of the EFL teachers believed that attaining educational change is not only about introducing new reforms and instructions. For them, despite the availability governmental ICT initiative, ICT classroom is still at low level. It seems possible to state that the implementation of ICTs requires the development of adequate ICT infrastructure, the provision and supply of universities, with the needed technological appliances. Nonetheless, the analysis of the obtained findings revealed that ICT integration approaches do not match with existing educational frame.

ICT infrastructure refers the fundamental components and systems required for the effective use and functioning of digital technologies for educational purposes. It includes computers, whiteboards, audio-visual aids, projectors, internet connectivity, etc. This study has identified that ICT Infrastructure is a significant condition for teachers' ICT adoption into their teaching practices and it has proved to be among the main constrains for technology use in general. Accordingly, teachers need to have easy and ready access to the essential digital learning resources, in addition to, the provision of the necessary time and opportunities to use those resources appropriately. To attain this aim, policy-makers should:

- Make the necessary financial investments;
- Provide support and resources to the universities of financially-low areas;
- Examine the effectiveness of the government's funding strategies;
- Constantly identify the related factors to monitor ICT implementation;
- Ensure teachers' and students' equitable access to ICT devices and resources;

Exceeding this line of recommendations, teachers as participants in the new modalities of teaching learning processes are obliged to develop critical stances to get the realm of their benefits. As Blázquez (2003:14) states that:

> We are aware that the Internet is not and will not be the panacea, it will not even become - to our judgment- a suitable educational means in all situations, furthermore, a proper critical distancing will be required to educate with it.

In this regard, the colossal provision of telematic networks, internet, multiplicity of online learning spaces and computer appliances offer new educational scenarios where the conception of both students and teachers are rewired and innovative instructional models are called for.

5.2.3. ICT Training: Teachers' Journey to ICT Competence

The investigation of EFL teachers' attitudes towards the use of ICT has shown that ICT competence defines the level of expertise that is crucial for teachers' intentions and actual inclination towards ICT adoption. Introducing ICTs into today's classroom do not make the learning effective. Teachers need to "understand how to use technology effectively, understand the learning theories behind the practice and know how to select the right technology for the learning outcomes they seek" (Howell, 2012, p 5). Therefore, ICT training is seen as a prerequisite for teachers to learn best how to incorporate ICTs into their professional practices. Moreover, it helps them change their beliefs and attitudes regarding educational technologies usage.

It seems possible to state that as far as teachers are concerned with the integration of ICTs in education; and EFL more precisely, they need to have knowledge of how to embody such technologies within the field of instruction in ways that bring the content of the curriculum in conjunction with different components and stages of the learning process all together. That is to say, they need to understand what these technologies are so that to choose the right integrating pedagogy that goes with their teaching philosophies and perspectives, i.e., to be skilful enough to find out the suitable technique for integrating such technologies and reap out its full benefits and coming out with maximum amount of advantages (Chen, 2008).

None can deny that special skills are needed to teach in today's Modern and Virtual Learning Environment (MVLE) that encompass an avalanche of synchronous and asynchronous tools together with determining training needs (Hample, 2009). For today's teachers to be digitally competent, they have to acquire and update essential skills because they need to manage various aspects; starting by the subject being taught to pedagogical tools. To achieve educational-related goals, ICTs should be used in confident, critical, and creative ways. Alutaibi (2003) mentioned that to improve teachers' ICT proficiency, training courses should address three levels: ICT skills, pedagogical skills, curriculum training.

In concurrence, Hampel (2009) stated that the use of online technologies concerns different aspects that teachers should consider. He mentioned that these aspects include the following:

- Benefit from the affordances provided by multimodal technologies;
- Taking account of emotional and social features in these computer-based learning environments, for instance, community building;
- Boosting learner autonomy; and
- Generating courses and activities best fitting the online learning environments' needs.

Along, Meenakshi (2013) mentioned that ICTs permeate the learning environment to furnish an upheaval changes which require vast competencies which are as follow:

- Critical thinking
- Generalists (broad) competencies
- ICT competencies enabling expert work,
- Decision- making
- Handling of dynamic situation,
- Working as a member of a team, and
- Communication effectively.

To support these advocates, Straub (2009) reported that technology literacy has been witnessing an increase of attention to be incorporated in mandated curricula which puts a pressure on school districts and teachers to adopt such technologies. He stressed that the embodiment of technology is at a higher level, such as policy-makers and school districts whereas individuals' adoption patterns that demonstrates a thriving implementation. Hample (2009) cites Hubbard and Levy's (2006) observations concerning training teachers in CALL in their book that is named 'the need for both technical and pedagogical training in CALL, ideally integrated with one another', where they mention how teachers could be learners in using CALL to learn about CALL to be used in their teaching, i.e., experiencing Multiple educational literacies that contribute to efficient understanding of technology use in language teaching/learning.

In short, as the presents' study results indicated that teachers' constant discussion regarding the use of technology into their educational practices is a crucial factor in facilitating the integration of ICTs. Hence, teachers need to observe colleagues, students, and similar others carrying out tasks using such tools to build their competence and feel in a supportive collaborative environment. Teachers are likely to perform well as they participate in learning communities that negotiate and discuss the use of new materials, methods, and approaches. This ICT vision needs to be accomplished by a well designed digital policy about how, what, and why ICT is used to provide the supportive opportunities for teachers' ICT usage.

Further, thinking of how teachers would be able to use ICTs, Sweeney's (2004) claims are recommended. She stated that the same processes occur in any kind of learning for young or adult learners when they want to learn about new things, at first, learning begins

by watching a teacher model strategy, then, such strategy is practiced with scaffolding (assistance) to be used independently in different contexts through time and practice. She pointed out that in learner-centred professional development; contrary to traditional forms of teachers' in-services, modeling and demonstration are the significant strategies of gradual release continuum that teachers move through. At the first phase they observe an exemplary instruction and depict a visual picture; by receiving coaching, i.e., they move to guided practice phase where teachers receive feedback, share peer observations, have instructional coach and discussions to implement the new teaching strategies which could be the phase of independence. This latter may witness some other attempts depending on teacher's knowledge base and the complexity of the new learning.

To warp it all up, training helps teachers perform adequately in planned or unplanned situations. Consequently, this element (training) can be considered as another aspect that has much affordance to learning and development, at the same time, it is regarded as a paramount concomitant to formal training rather than focusing exclusively on structured training and educational events. Eventually, "Training, education, planned and unplanned experience are interdependent and equal partners with regard to their potential contribution to learning and development" (Buckley and Caple, 2009, p. 12). To create teachers' professional development plan, ICT trainers need to obtain information and their knowledge, skills, and attitudes, i.e., their digital literacies and competences need to be assessed

5.2.4. TPACK and ICT Training: A Suggested Matrix into Content Selection and Digital Pedagogy Development

In the view of improving teachers' level of ICT competence, a matrix is suggested to briefly highlight and posit contends and prerequisites for better ICT implementation. As many authors believed such as Moseley and Higgins (1999) and the obtained data revealed, it is acknowledged that the behaviour of teachers is influenced by their thoughts and skills to manage classrooms, their subject knowledge to the content being taught and their knowledge to the group in question together with their skills and experience in teaching particular skills and knowledge that is referred to as Pedagogical Content Knowledge (PCK) which is defined as "the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized,

represented and adapted to the diverse interests and abilities of learners, and presented for instruction" (Shulman, 1987, p. 8).

Derived from this background, Koehler and Mishra (2009) Technological Pedagogical Content Knowledge (TPCK) model is suggested to content selection and pedagogy development for adequate ICT training. This matrix presentes a framework for teachers' knowledge for technology integration; now known as TPACK that is technology, pedagogy, and content Knowledge.

Koehler and Mishra (2009) stated that at the heart of a meaningful teaching with technology, there are three key components; content, pedagogy, and technology, together with the relationship between and among them. The interactions between and among these bodies of knowledge generate, PCK, TCK (technological content knowledge), TPK (technological pedagogical knowledge), and TPACK.

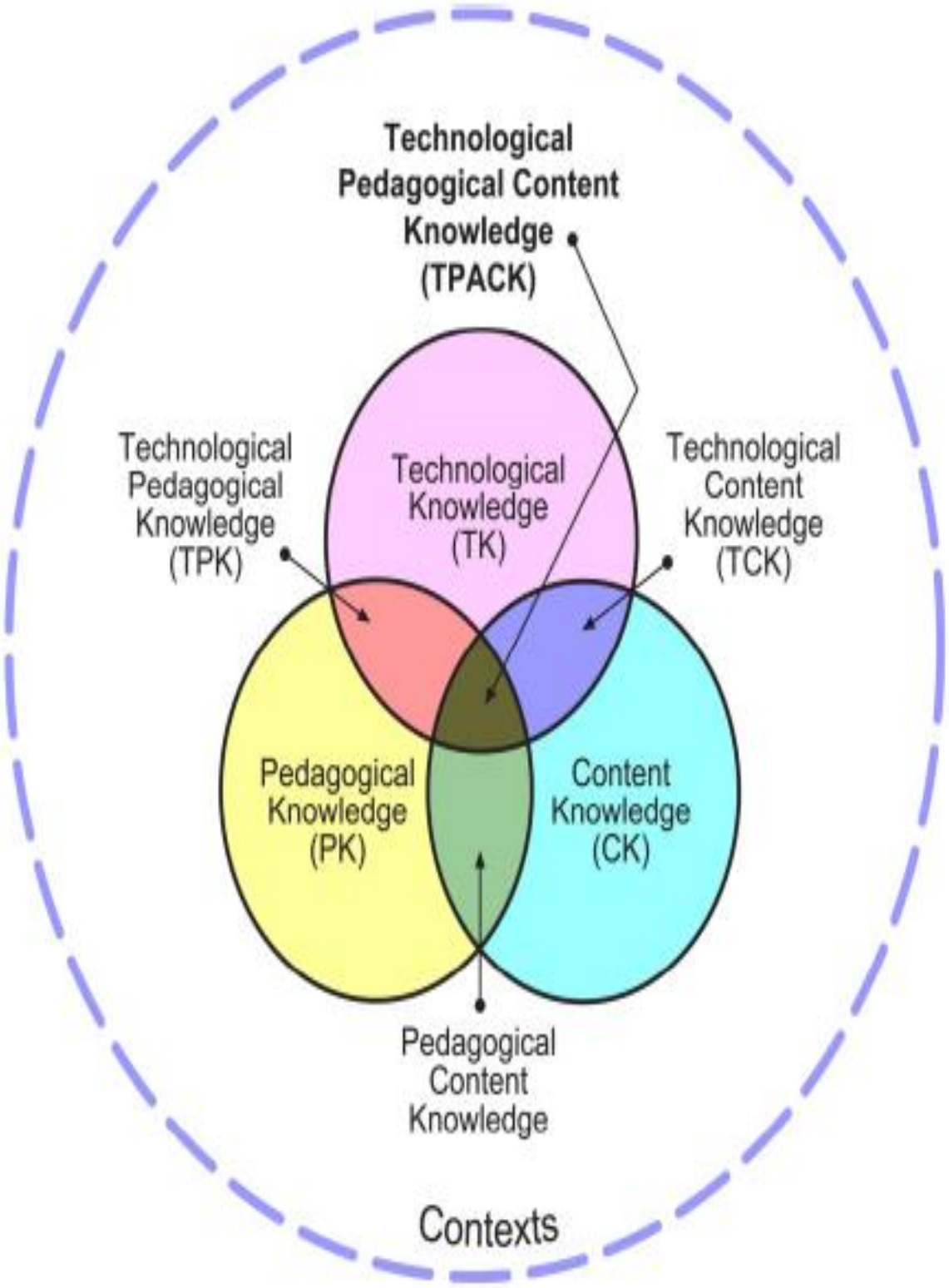


Figure.5. 1. The TPACK Framework and its Knowledge Components (Adopted from Koehler and Mishra, 2009, p. 63)

Briefly, Koehler and Mishra (2009, pp. 63-66) defined each component as follow. Content Knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught. This knowledge of content is of great significance covering knowledge of concepts, theories ideas, approaches, and organisational frameworks. Pedagogical knowledge (PK) represents teachers' profound knowledge they possess regarding the processes and methodologies of teaching and learning; including understanding how students learn, general classroom management skills, lesson planning, and students' assessment. Therefore, Pedagogical Content Knowledge PCK covers the transformation that occurs when the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to the alternative conceptions and students' prior knowledge.

Another component in this frame work is Technology Knowledge (TK) which definition is somehow vague to identify, yet it is close to digital competence that proposed in the literature review, i.e., technology knowledge goes beyond traditional notions of computer literacy that entails individuals to comprehend Information Technology (IT) deeply. It involves profound understanding and mastery of IT for information processing, communication, and problem solving to be able to accomplish a raff of tasks and develop multiple ways of accomplishing these tasks.

The interaction with the previous components generates the notion of Technological Content Knowledge (TCK) which deals with understanding the way in which technology influence the practice and knowledge of a given discipline. On an educational level, understanding the impact of technology on the practice and content of subject matter is critical for developing adequate technological tools for educational purposes that is "the choice of technologies affords and constrains the types of content ideas that can be taught" (Koehler & Mishra, 2009, p. 65). Teachers must understand which technology is best suited for addressing subject-matter learning and how the content of the subject matter changes the technology.

Moreover, understanding how teaching and learning can change when specific technologies are used in particular ways is what Technological Pedagogical Knowledge (TPC) refer to. It involves the consideration of the pedagogical affordances and constrains of a given technological tools as they relate to pedagogical designs and strategies of a particular discipline. Particularly, most software programs are not

designed for educational purposes; however, teachers must develop skills to envision alternatives beyond the conventional uses of technologies and reconfiguring them for adapted pedagogical purposes. " TPK requires a forward-looking, creative, and open-minded seeking of technology use, not for its own sake but for the sake of advancing student learning and understanding" (Koehler & Mishra, 2009, p. 66).

The interactions among these core three components (content, pedagogy, and technology) generates a form of understanding and knowledge that emerged and goes beyond them which is Technological Pedagogical and Content Knowledge as already mentioned. It underlies the basis for effective teaching with technology; entailing the comprehension of the representation of concepts of using technology, pedagogical techniques that utilise technologies in constructive manners to teach content, understanding what factors render concepts difficult or easy to learn and how technology can assist to alleviate certain constrains encountered by students, and understanding students' prior knowledge along with the ability to employ technology to build upon existing knowledge to foster new perspectives and strengthen the old ones. Koehler and Mishra (2009: 67) summarise it in the following lines;

> Teaching with technology is a difficult thing to do well. The TPACK framework suggests that content, pedagogy, technology, and teaching/learning contexts have roles to play individually and together. Teaching successfully with technology requires continually creating, maintaining, and re-establishing a dynamic equilibrium among all components. It is worth noting that a range of factors influences how this equilibrium is reached.

On the whole, TPACK frameworks seems to be essential for policy-makers, practitioners, and teachers to take it in to account because it offers a variety of possibilities for teachers' education, teachers' professional development, and teachers' use of technology. It outlines the connections among technology, pedagogy, and content found in the classroom contexts and the key knowledge that teachers should possess for technology integration. At a broader sense, it presents options for technology integration that's why it has been selected as a framework and the basis for

adequate ICT training foundation and ICT module development that could be labelled as EdICT, namely "Education of ICT".

5.3.Trainers' Roles

A high percentage of the EFL teachers felt that the provided training does not match the existing requirements for ICT use into EFL context. Therefore, teachers were hoping for the creation of adequate ICT training programs. This duty felt to the role of the trainer. In the view of Barbazette (), ICT training basically focuses on the trainer's role being the course designer as having "the ability to set an adult learning climate" (p. 14). From the previously revised TPACK model and as emerged from the gathered data, a set of items must be taken into consideration as technology content creator and digital proficiency developer. The trainer is responsible for setting an adult learning climate, describe the behaviour, list the expected results or outputs, and determine supporting knowledge, skills, and attitudes. For ensuring the relevance and effectiveness of ICT training course, trainers need to consider and fulfil the following key roles:

- Needs Analysis: It is crucial for the trainer to specify the basic and advanced competencies. A comprehensive assessment is required to identify the level of proficiency, the challenges, and the needs of teachers. It should be undertaken before planning mere theoretical inadequate ICT training sessions and provide a supportive dynamic environment to improve teachers' ICT competencies. Also, needs analysis is paramount to specify areas of focus and priority for training. Needs analysis can be run through the use of questionnaire, interviews, or regular meetings.
- Content Selection and Development: the trainer needs to incorporate real-life examples to allow teachers experience ICT tools and understand their educational concepts so they become able to apply them in their teaching practices. S/he needs to outline clear learning objectives to determine what teachers will be able to accomplish after finishing the course.
- Pedagogical Knowledge Development: Practical, interactive together with an engaging learning environment, content and materials are

highly required; including presentations, tutorials, and workshops. Trainers have to provide a supportive learning atmosphere for teachers to promote experimentation and collaboration where they (teachers) feel encouraged to exploit the multiple ICT strategies and practices. In training delivery, they should explore the usages of the digital materials and resources, online platforms, online learning collaboration tools. In this vein, teachers will increase their level of ICT knowledge and their proficiency of what, when, and how to use the available educational technologies.

- Evaluation and feedback: Needs analysis, content design, and pedagogical knowledge development are one side of the coin. Post training's assessment is necessary to measuring teachers' understanding of ICT concepts and applications and identifying gaps for reinforcements.
- Continuous improvement: It is important for teachers to be up to date and aware of the available innovative teaching technologies, not only, having that capacity to know where information, resources and tools are obtained (Chen, 2008). Hence, policy-makers need to constantly train teachers and re-evaluate ICT training programs to meet the rapid growth of technology, teachers' evolving needs, and educational changes.

Overall, Policy-makers and trainers should ensure the accessibility of ICT training to all teachers from one hand. On the other hand, institutional headmasters had better negotiate the inclusion of ICT module as compulsory for Didactics' students especially that the results revealed that students who showed high level of appreciation to ICT. To maintain such attitudes, they should receive constant training. As already mentioned, the development of an ICT module is highly required that could be labelled as EdICT, namely "Education of ICT".

The teacher of the EdICT share the same roles of the trainer, yet a number of variables should be taken into consideration while dealing with students. The reception of theoretical training and the basic literacy of ICT were the major outcomes of the students' interview. Hence, it is recommended that the module EdICT should also focus

on the practical aspect of training students to be competent users of ICT in their future teaching practices. The teacher should:

At the first theoretical phase:

- Set a clear objective that ICT training lessons is to provide the students with the necessary competence and skills for ICT integration;
- Explain the notable technology-enhanced language learning approaches to form the theoretical background of ICT use; including the contribution of ICT in enhancing modern teaching and learning modalities;
- Familiarise students with the popular and effective educational technologies used in EFL context, such as online learning platforms, learning applications, and other digital resources;

At a practical phase:

- Set an engaging learning environment
- Provide practical demonstrations;
- Divide the students into small groups;
- Allow students to explore the real use of ICT tools and perform out real-like teaching situations;
- Encourage students-students discussion and exchange of ideas in class;
- Invite students to communicate their needs and limitations,
- Encourage the students to reflect on their learning experience and develop the critical thinking skill.

For both ICT training concept and EdICT module, digitally competent teacher knows what is feasible. In a nutshell, the ICT Competence key elements involve the capacity to question the obtained information and use that digital literacy knowledge to analyse and re-create new digital forms, to make individuals aware of the prevalence of digital technologies in today's society to create better community and a successful digitally-literate person this can be reached by expedient training and the role of trainer being a

teacher of students-teachers when teaching the module of ICT or in-service teachers' tutor.

5.4.Considering the Evolution of ICTs, the Future of EFL Teaching, and Teachers' Attitudes: A Focus on AI into EFL

Artificial Intelligence (AI); as the most advanced ICT tool today, is invading every life's sphere, education is no exception. EFL teaching and learning has been revolutionized by the prevailing of AI too. It is playing a significant role in e-learning, especially with the wake of recent global events of Covid-19. AI companies such as Open AI has provided tremendous AI tools valuable resources for offering the most personalized learning experiences for learners. These tools try to make education more accessible. It has the capacity to adapt to individuals needs and requirements together with providing tailored support and guidance. This assistance is to enable individuals actively participate in the process of learning.

The results gathered in this study functions as a stepping stone in understanding the existing framework in the Algerian university and the attitudes that teachers are holding towards such educational technological tools. These insights contribute in figuring out ways of implementing AI tools into the EFL learning and instruction. The following sections shed light on the importance of AI today, the available AI tools, the change of teachers' roles, the emergent concerns together with attitudes, and recommendations for these AI technologies' integration in general.

5.4.1. AI Revolution

The definition of AI states that "tasks that can be operated automatically using self governing mechanical and electronic devices that use intelligent control". AI has drastically revolutionised and fundamentally altered the ways individuals collect and process data, transforming business operations as well as educational scenarios across different aspects. AI generally refers to the study of intelligent systems which can generate tasks and activities that require human level of intelligence. AI systems are pertained to three main aspects that are domain knowledge, data generator, and machine learning. AI's versatility is the reason for its widespread adoption.

The rise of AI use in learning is one of the most thrilling advancements in current years. This increased use of AI in education can be subject to the capacity to revolutionise teaching and learning together with customising and personalising learning (Eldin, 2023). He explained that AI-powered tools have the ability to alter teaching methodologies and pedagogies that most of the instructors can design customised curricular and lessons subject to students' styles and requirements. They can create engaging and innovative materials. This can help students learn better and again cast light on the move from traditional learner-centeredness towards modern concept of centeredness in involving students into the learning progress and making them active participants. This revolution emphasises the need of generating students able to apply their competencies in a high-tech era.

5.4.2. Best AI Tools and their Affordances for EFL Learning and Instruction

Among the AI tools that are helpful in education, Cohen (2023) identifies three popular types of AI tools. First, AI based Learning Management Systems (LMS) which revolutionise the way individuals interact with course materials and assessment. It tracks students' progress and areas of supplementary practice to assure more customised and effective learning experiences. Second, AI powered tutoring tools where virtual tutors are found to offer tailored lessons, explanations, and feedback. Third type is AI tools for Language Learning where stimulation of real-life conversations, analysis of pronunciation, adapted lessons are found.

AI tools are becoming widely recognised by teachers and students due to their accessibility and adaptability. The purpose of education is being re-evaluated with the emergence of these tools. At the same time, it can be seen that AI-powered tools are providing huge opportunities for teachers to enhance their professional experiences and teaching practices as well as help students improve their learning process and performances.

Through the use of AI tools, teachers can spend less time doing administrative tasks and focus more on doing their teaching practices and support their students in learning. Raturi (2024) provided a list of potentials that AI tools can afford to teachers. It is as follow:

- Automating Administrative Tasks: AI tools can help teachers reduce time consuming in lesson planning. These educational technologies can also assist teachers to adapt the curriculum according to students' level and needs. In addition, AI tools can track students' attendance through cameras and facial recognition technological systems that can save teachers valuable time and eliminate manual attendance checking. Such technological tools can be also used for grading and assessing assignments and works quickly and accurately through special machine learning systems.
- Personalised Educational Opportunities: AI systems allow teachers to have an idea about their students' need through the use of adaptive learning platforms. This permits students to perform well in their learning process according to their own pace. At the same time this also allows teachers to measure and monitor the students' progress.
- Time Saving for Teachers: The above provided potentials by AI tools contribute to free up teachers from workloads and allow them to have more time for instruction and students enhancement.
- Learning Material Selection: They propose appropriate educational resources and materials and suggest tasks based on lessons' objective, interests, and needs.
- Enhance Students' Engagement: teachers can tailor their lessons through the use of AI-powered technologies. This can increase students' motivation and engagement due to constant assistance they receive which would lead them to mastery of material they deal with. Even the personalisation of learning experiences lower students' anxiety and allow them to overcome the encountered difficulties.
- Monitoring and Assessment: A real-time feedback is provided that teachers can easily identify areas of weakness and provide extra assistance.
- Fostering Skills and Creativity: Students will develop their future skills such as problem-solving and critical thinking. AI tools can allow them to track the pace of technology advancement and increase their creativity. For teachers, AI can also reduce teachers'

stress and allow them to care about their profession as well as inspire and coach their students.

The most AI tools that seemed to be effective in education in 2024 are; for example:

- **ChatGPT**

ChatGPT is among the pioneer AI-powered technologies. GPT stands for “Generative pre-trained Transformer”. It is an AI chatbot which uses natural language processing to generate human-like conversation (Hetler, 2023). It provides instant answers for everyone and on a large range of topics in a form of written content such as articles, codes, emails, and posts. As well as, users can ask for more explanation for ChatGPT replies.

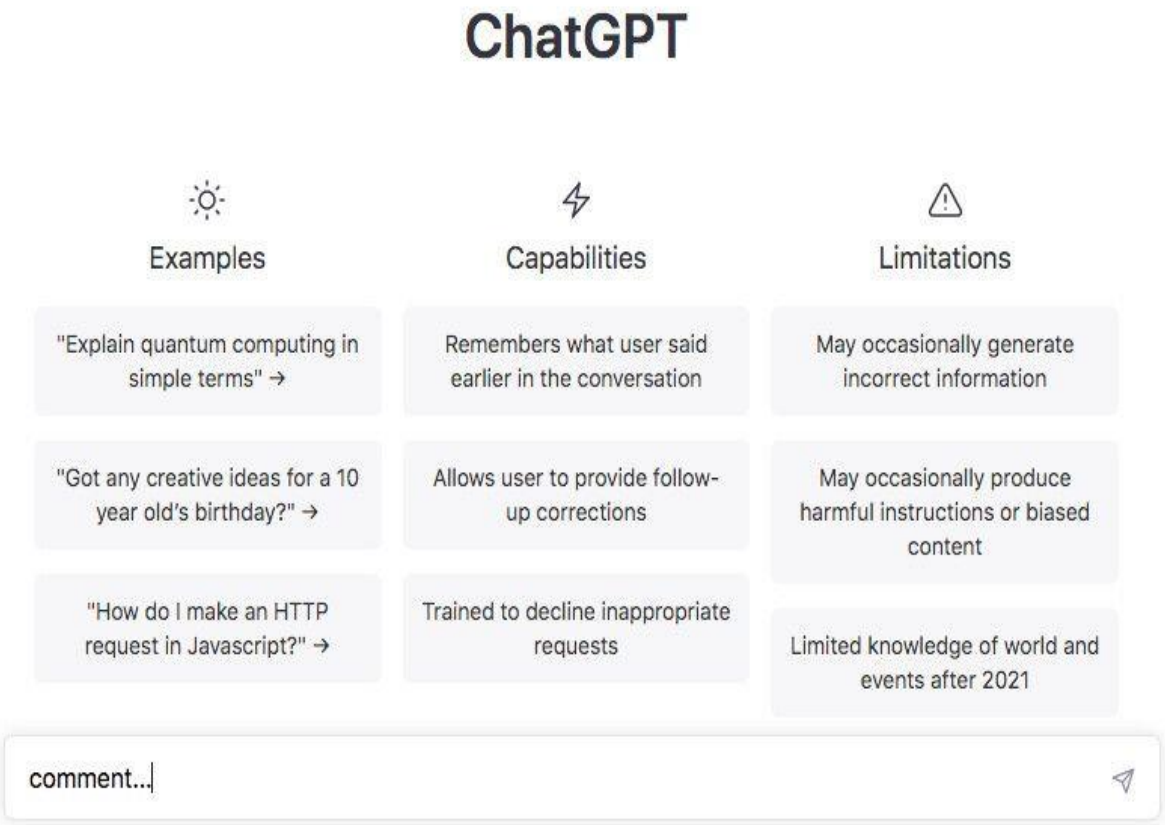


Figure5. 1. ChatGPT

Hetler (2023) stated that this form of generative AI uses deep learning and individuals can use it to do the following:

- Code computer programs and check for bugs in code.

- Compose music.
- Draft emails.
- Summarize articles, podcasts or presentations.
- Script social media posts.
- Create titles for articles.
- Solve math problems.
- Discover keywords for search engine optimization.
- Create articles, blog posts and quizzes for websites.
- Reword existing content for a different medium, such as a presentation transcript for a blog post.
- Formulate product descriptions.
- Play games.
- Assist with job searches, including writing resumes and cover letters.
- Ask trivia questions.
- Describe complex topics more simply.
- Write video scripts.
- Research markets for products.
- Generate art.

Despite various differences, ChatGPT possesses many common features to Gemini, and Copilot. They are found to be among the pioneers of AI tools. The three are chatbot AI which use natural language models to create replies in forms of text or codes. The three respond in a conversational manner. All of them provide information from relevant resources available on the web. ChatGPT uses the GPT 3,5 model but Gemini and Copilot are using the GPT 4 model which can handle pore complex operations such as editing pictures and creating more detailed answers (Hetler, 2023).

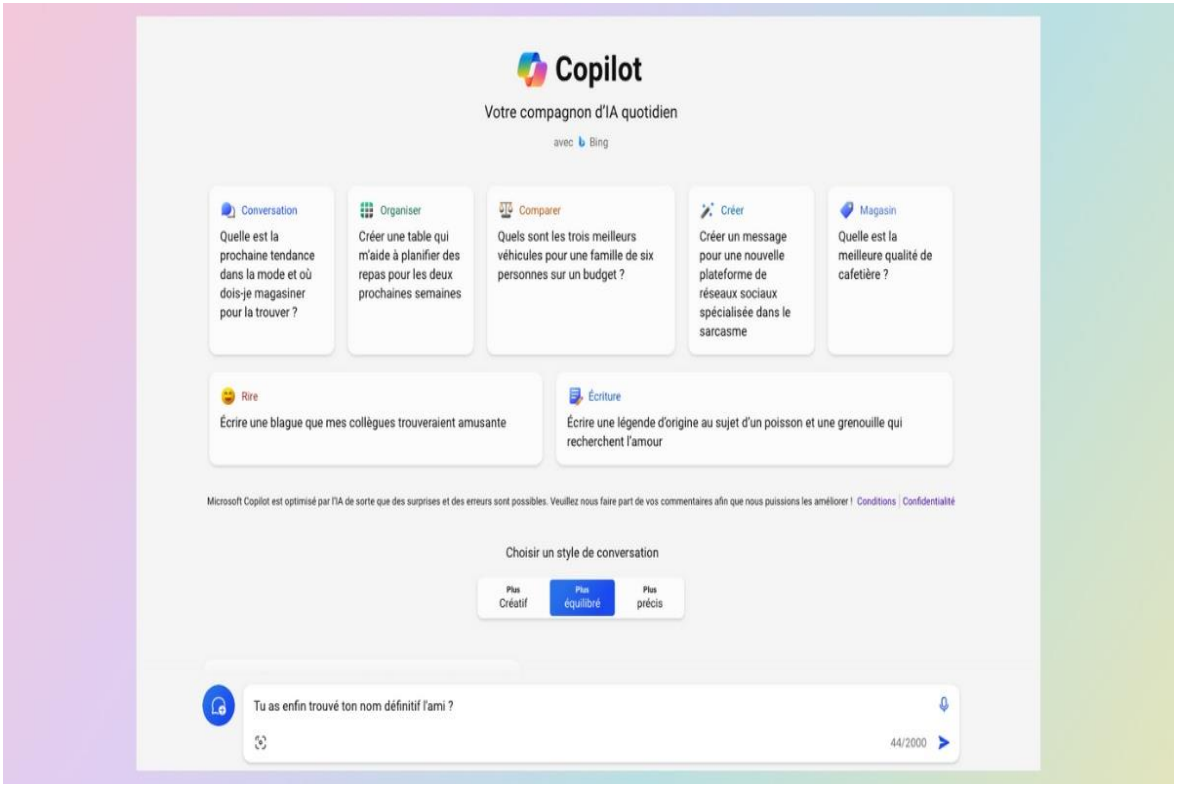


Figure5. 2. Copilot Microsoft

Figure5. 3. Gemini

❖ **ClassPoint AI**

ClassPoint AI is an innovative AI tool that has been designed particularly for teachers to let them generate questions out of any PowerPoint Slide. It can maintain interaction and efficiency into the classroom and preparation time. ClassPoint AI presents transforming presentations and interactive learning experiences (Puntillo, 2023).

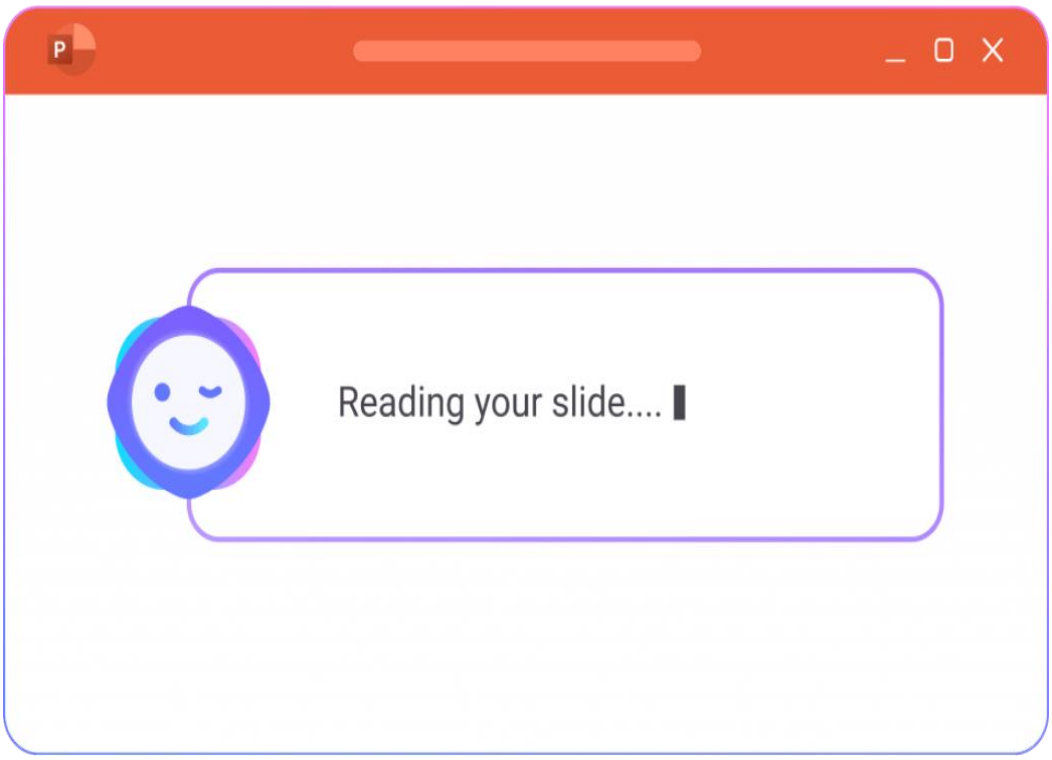


Figure5. 4. ClassPoint AI Generating Slide

ClassPoint AI can enhance teachers' presentations in three key areas; with added presentation tools, interactive quiz questions, and gamification reward system. After subscription, ClassPoint AI becomes integrated in PowerPoint Presentation; permitting teachers to use it immediately. Out of the words written in the PowerPoint slide, ClassPoint AI can detect the words to generate interactive quizzes using Bloom's Taxonomy Levels. As illustrated in the figure below, teachers can select from three different types of questions: Multiple choice questions, short answers, or fill in the blanks (Puntillo, 2023).

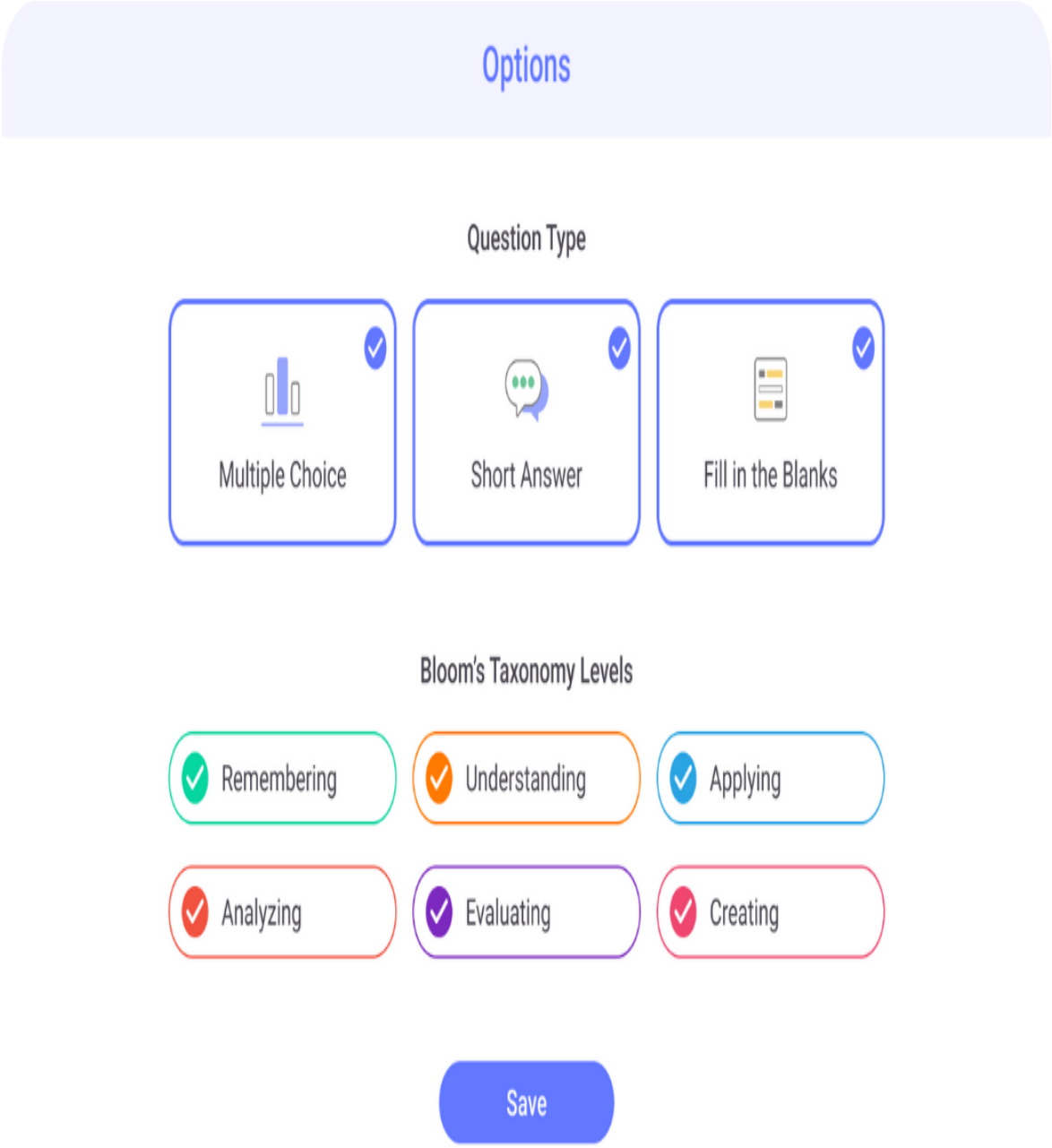


Figure5. 5. ClassPoint AI Generating Questions' Options

Teachers should be aware of the attributes provided by ClassPoint AI; including that:

- It is integrated directly in PowerPoint;
- It provides engaging presentations;
- It offers flexible and customised learning questions;
- Questions can saved as slides;

- It turns questions into interactive quiz that students can answer from their devices;
- It is Constant feedback provider and time saver. The number of choices and correct answers will automatically appear where the teachers can enter presentation mode and run the questions with their live students;
- It provides a chance for awarding students. Teachers can award their students stars for the correct answers. (Puntillo, 2023).

- **QuillBot**

QuillBot is an AI-powered paraphrasing tool that can offer free plan as well as monthly premium paid plans. This AI technology improves users' writing skills. It includes words paraphrasing, grammar checking, plagiarism detector, citation generator, and more. QuillBot can review, treat, and automate written communication. as can be illustrated in figure 5. below.

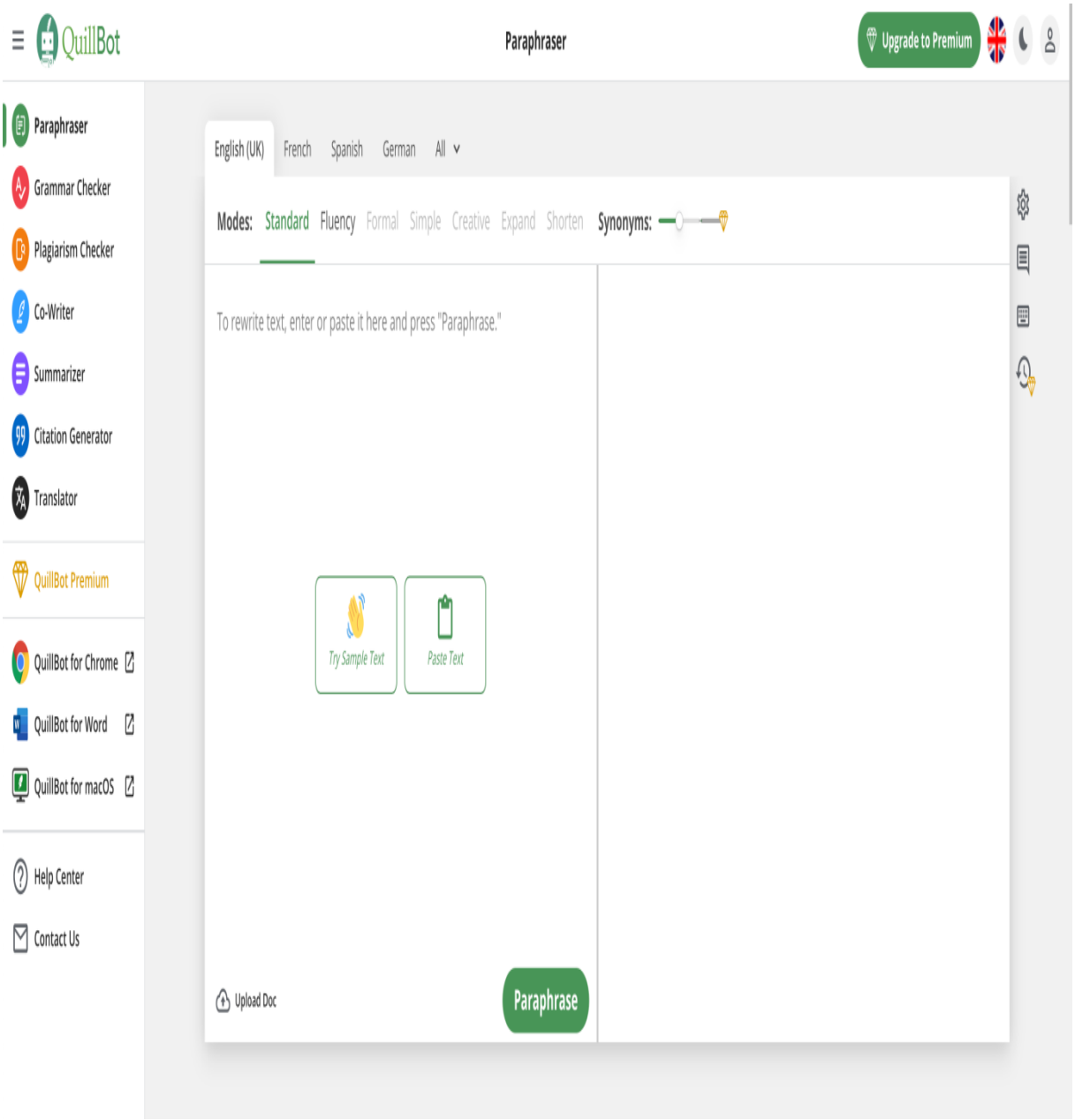


Figure5. 6. QuillBot

QuillBot can provide different uses and contributions in education and for both teachers and students. Students can beneficiate from the different features of QuillBot to generate sentences and paragraphs in multiple ways while writing about the same topic. This ways, students can expand their vocabulary, learn many methods of expressing their ideas and avoid plagiarism. With QuillBot, students can be auto-corrector since it helps them correct their grammar, spelling mistakes, and punctuations. As a result, their language proficiency and writings' quality are enhanced. Students can save time and divert their attention to accomplishing other assignments and learn new skills.

Teachers can also make use of QuillBot to measure students' writing performances and provide instant and personalised feedback. It helps them identify points of strength and weakness and suggests implications for students' academic writing and research skill improvement as well as assessment (Rowell, 2023). It can assist teachers to generate new teaching materials and worksheets from already existing materials. It can aid them save time planning lessons and selecting materials.

It can be said that QuillBot can improve teachers' educational practices and present interactive and engaging learning experiences. Various features are common among QuillBot and **Grammarly**. This later is also a writing assistant that helps in the detection and correction of the mistakes of grammar, spelling, punctuation, etc. Similar to them, **Copyscape** is another AI-powered tool that teachers should be aware of and make use of. It is a plagiarism detector that can help students avoid unintentional plagiarism and ensure the originality of their works and writings.

- **Education CoPilot**

Education CoPilot is an AI-powered platform that every teacher may require today. It is available of both free and paid versions; of course paid one offers advanced features. Education Copilot facilitates the creation of lesson plans, academic handouts, worksheets, templates, PowerPoint, assignments, and scholar performance reviews (Eldin, 2023). In similar words, this software allows teachers to design customised lesson plans and activities which can cater students' needs and track their progress (Adlawan, 2024).

Figure5. 7. Educational CoPilot

In clear points Eldin (2023) outlines the following components of Education Copilot, its feature, and advantages:

- Its Components:
  - AI lesson planner
  - Academic handouts
  - Writing prompts

- Student reviews
- Project outlines
- Over 10 different tools to assist keep time in and outside the classroom

➢ Its Features

- Automate administrative tasks
- Customizable lesson plans
- Personalised learning
- Structured templates for any problem, lesson, or concept
- Immediate generation of templates for lesson plans, writing activates, instructional handouts, scholar reports, mission outlines, and greater

➢ Its Advantages

- Saves time and energy for teachers
- streamlines the lesson planning and preparation procedure
- Generates customised learning content and experiences students
- Enhances students performances
- Automates administrative tasks
- Presents considerable feedback into student performance
- Reduces workload for teachers

It is significant to note that the central part of Education CoPilot is lesson planning. Teachers should consider that the use of such AI tool allow them to prepare well-structured

plans in less time and more efficiently for any subject area. Therefore, being aware of today's AI powered technologies is a must and a reality no more a matter of choice.

❖ Gradescope

Gradescope is an AI-powered grading and assessment tool. It is available in free version and paid one with more advanced options. The special feature about this tool, it is that it is designed to assess and grade paper, assignment, and exams effortlessly and effectively from a wide range of subjects and levels in science and humanity (Adlawan, 2024). Gradescope can detect plagiarism and provide insights that help teachers identify areas of improvement.

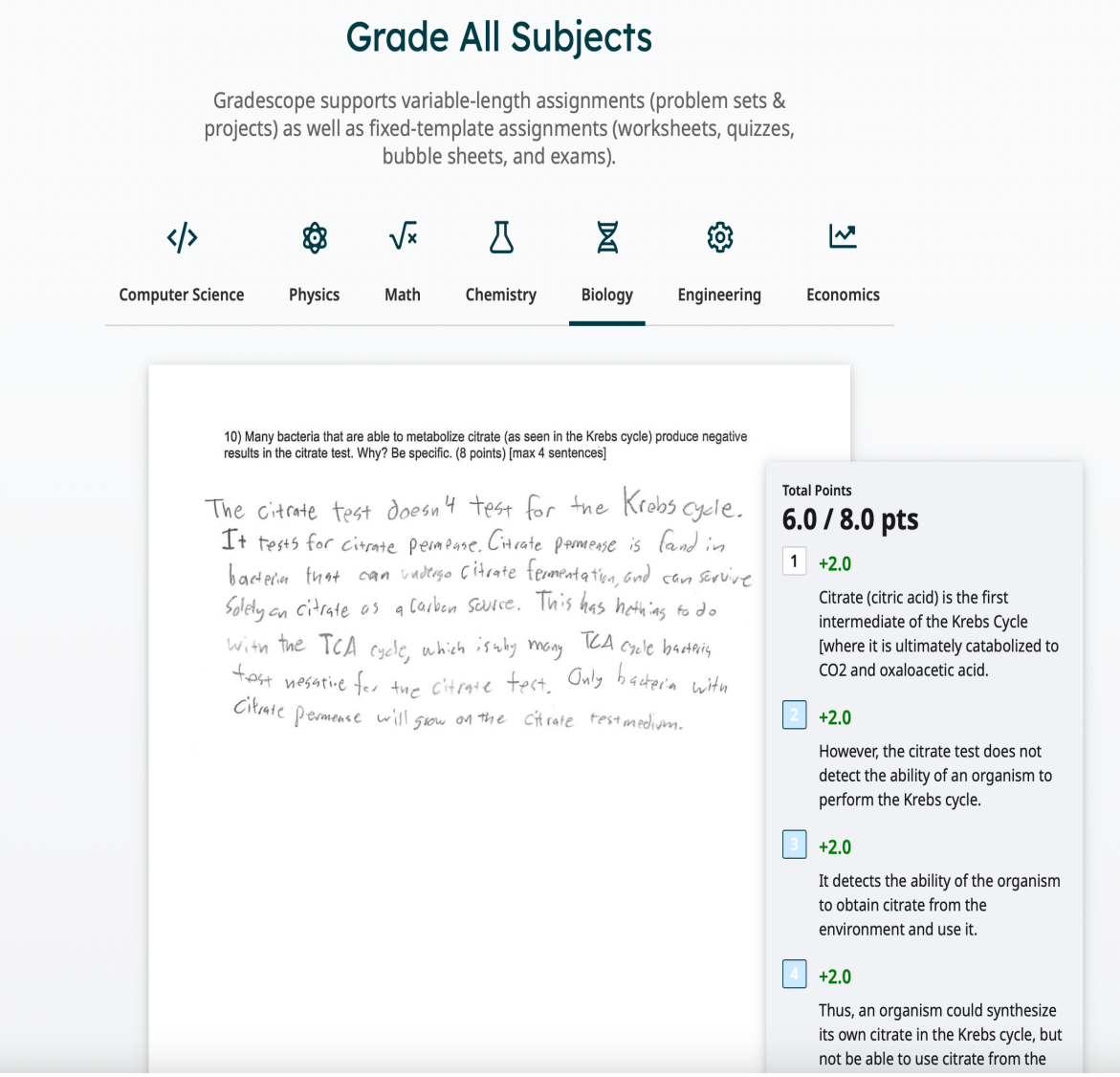


Figure5. 8. Gradescope

❖ **Formative AI**

Formative AI is a completely free to use AI-powered tool. Similar to Gradescope, this AI technology can be used to help teachers assist their students' learning works. Educational assessment has been positively enriched with the use of AI tools. Formative AI can provide computerised and customised testing and a continuous assessment. Again this tool supports teachers in doing their administrative responsibilities and duties

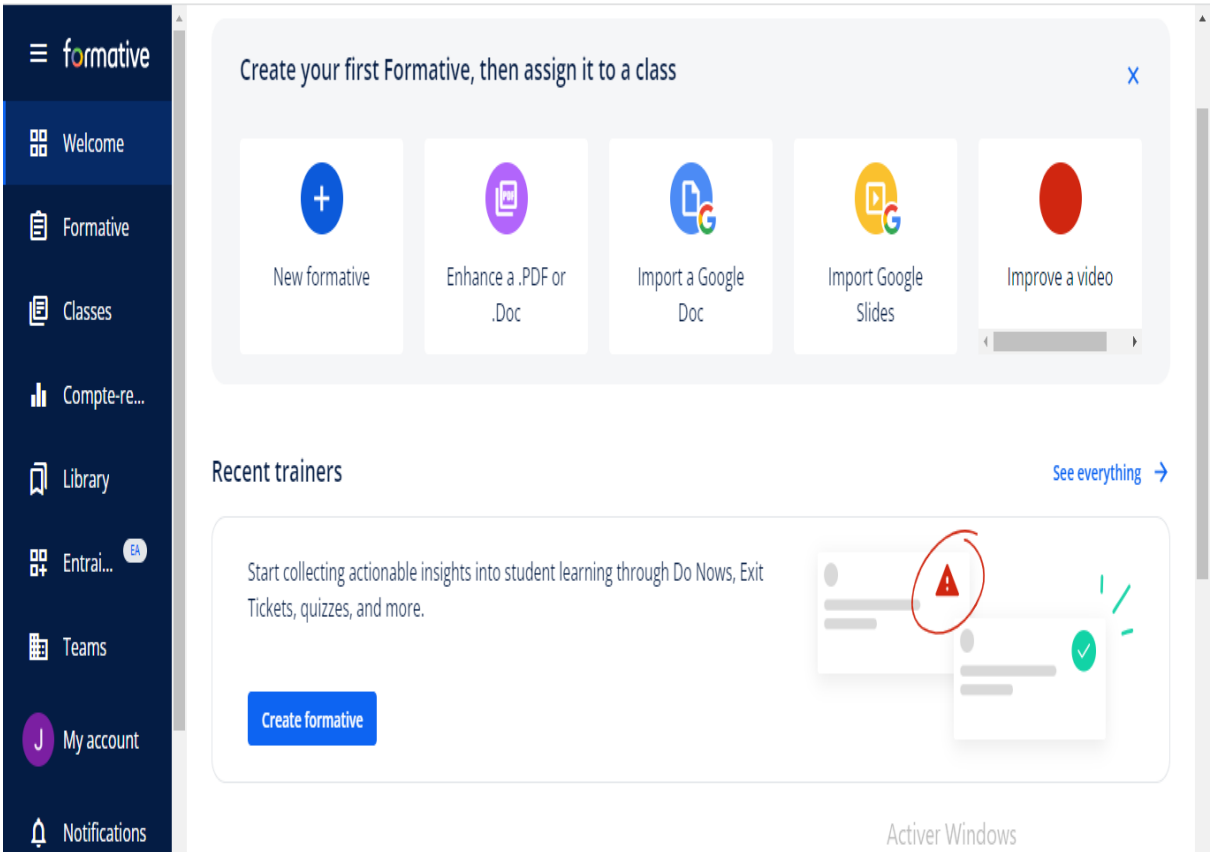


Figure5. 9. Formative AI

As can be seen in the figure below, Formative AI offers a set of assessment options such as multiple-choice questions, true or false, short responses, image-based questions, etc (Adlawan, 2024). In this regard, teachers can design assessments easily. They generate new formative AI through selecting questionnaire or lesson, then writing the title with specifying the level of to whom it will be addressed. After that, the assessment is created and teachers can check if any modifications are required to avoid bias or ethical threats. Adlawan (2024) has mentioned that Formative AI assists teachers to save time and automate the grading process, reduce the subjectivity that might be associated with human

grading, and provide a real-time feedback on students' learning performances which will allow the teachers to tailor their teaching strategies accordingly.

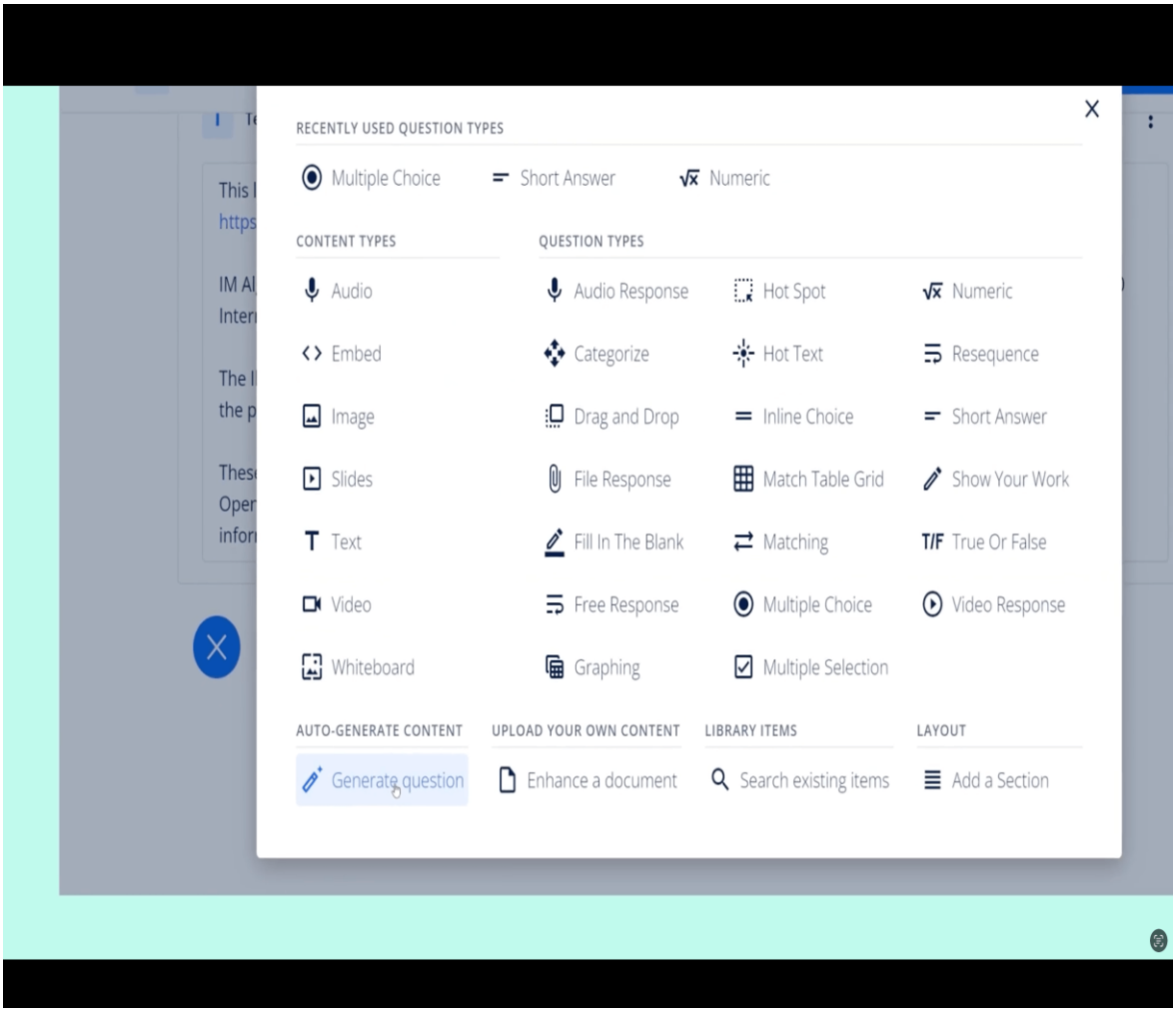


Figure5. 10. Options for Generating Questions through Formative AI

Through a shared link via emails, students can attend the class online with particular codes of access. These features are similar to Google classroom and Zoom but what is special about Formative AI is the ability to generate questions that help teachers assess their students learning performances effortlessly. In the same vein, students' responses are analysed in a way that enhances teachers to provide more effective and engaging teaching.

- **Conker AI**

Similar to Formative AI, Conker AI is an AI-powered tool to streamline formative assessment. It found in free and paid versions. It is used to generate quizzes, tests, and questions for different subjects and levels. To make use of this software platform, it is only

necessary to login where users directly find options to start and adjust then quizzes; including writing the title of the topic or providing a material that questions can be generated from that. Next, the teachers can choose the level of the targeted students to be tested, and then select they type of the quizzes in addition to the number of the questions. Once the questions are generated, other options can be found to edit and adjust the questions and the answers as well. What is special about Conker AI is that the resources of the questions are mentioned so teachers can consult the sites and check if the information is brought from a reliable source.

After all the generation and edition of questions, teachers can select to assign or export them. Among the options is either to share the link of the questions with the students who need to join conker.com and write their names and be able to complete the assessment online. Or, the assessment can be exported to Google forms then to be distributed on other online platforms. Otherwise, teachers can print the test sheet and also the answer sheet and students will answer in paper form. The described steps for Conker AI use are better illustrated in the figure below.

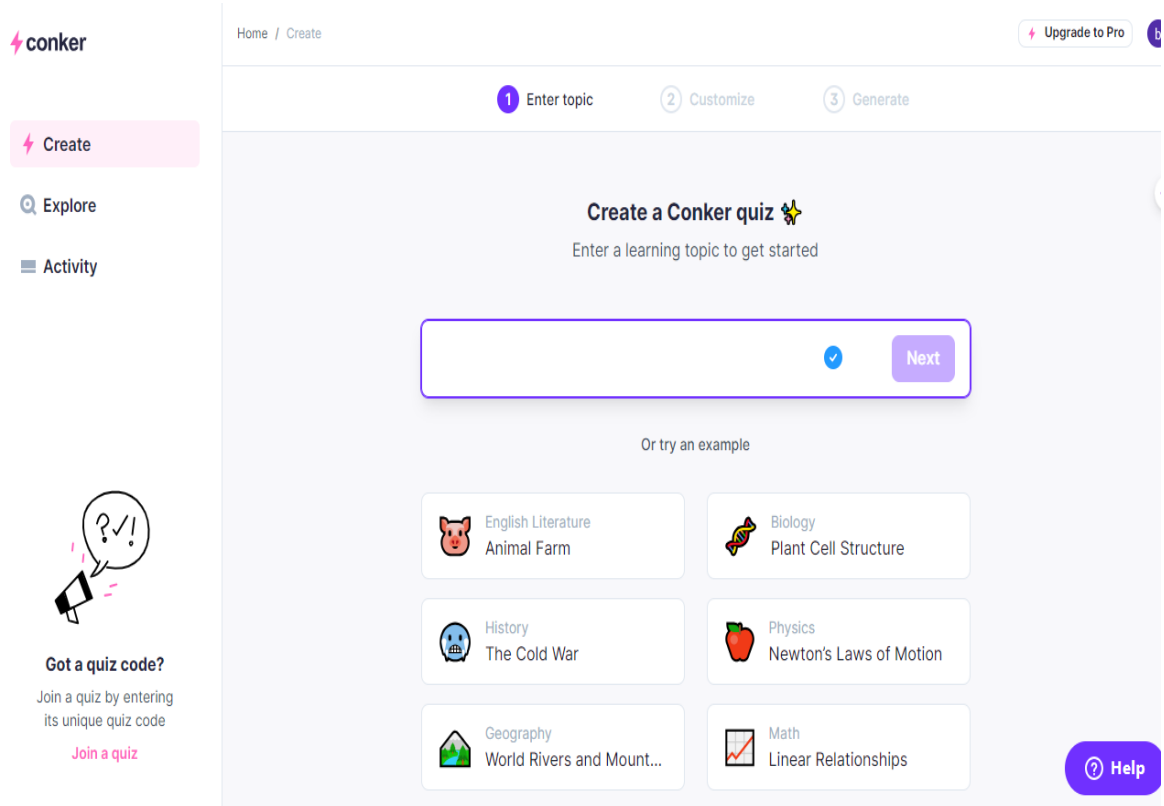


Figure5. 11. Conker AI

For teachers it is widely known that the process of creating assessment can be effort and time consuming and sometimes challenging with all the available workloads that teachers must accomplish. However, the introduction of Conker AI into education does not only automate the process of assessment. It enhances learning and assessment outcomes to generate more engaging educational experiences. Ward (2023) listed as follow the advantaged brought by the use of Conker AI:

- It ensures adaptability in learning since the questions can be generated and tailored in regard to students' level of proficiency;
- It has a dynamicity of questions generation with the option of reference checking;
- It provides real-time feedback into students' performances that will help teachers identify areas of further support;
- It maintains personalised learning experiences based on students' responses to meet their needs, pace, and styles of learning;
- It invites students to work in an online collaborative spaces where debates, discussions, and exchange of ideas are possible to occur;
- It helps teachers to have evaluative insights on students' performances and pedagogical practices in general.

These AI-powered technologies and more are not only shining, they are quickly evolving the landscape for educational technology (Ward, 2023). These software platforms are harnessing the power of AI to improve the learning experiences. Therefore, it seems significant to note that in today's digital age, the numerous AI educational tools are influencing teachers' adoption decisions. It is no more an end, it becomes a reality. With the available and listed AI tools, teachers can make the most creative, innovative, and effective teaching.

5.4.3. AI Critical Use in EFL Classroom

Based on the gathered data in this study, it is clearly addressing the necessity for understanding and sharing knowledge as well as developing policies for AI's critical use for EFL education rather than Overreliance on technology or rejection. In effect, these AI-

powered educational technologies integration has become a rapidly advancing process of crucial literacies and capacities that are increasingly required in all kinds of available educational technology systems. Educational considerations include technologies' effective design and their specific use for and in educational settings.

Office of Educational Technology (2023) reported that exceeding conventional educational technologies' affordances, AI presents shifts in data; from a) capturing data to detecting patterns in data, and from b) providing access to educational resources to automating decisions about instruction and other educational processes. In this regard, the process of integrating AI tools into EFL instructional practices may introduce different challenges and a number of decisions to consider. Within the EFL, teachers play an essential role in governing the use of AI educational systems. Great attention should be directed towards the opportunities of using AI to improve education and at the same time be aware of the confronts that would arise to be able to use these AI systems effectively. Adlawan (2024) provided the following points to make effective and impactful use of AI tools within the classroom, lesson plan, and teaching practices on the whole; such as:

- Define goals by identifying students' needs and lesson's requirements
- Research the adequate educational tool that best fit those needs
- Experiment the selected AI tool and provide adjustments where needed
- Analyse and reflect upon the learning outcomes.

The best use of AI tools in learning and teaching can be attained by taking these tips into account and unmentioned others.

It is important to recognise key insights brought by the new patterns in data and automating actions fundamentally found with AI as rapidly-advancing set of technology. The new forms of interaction presented by AI can generate a human like communication which may provide support for teachers to address the variability in students' learning styles and needs. AI may provide great support for teachers but never replace human teachers and the roles the accomplish.

Recommendations in this research work seek to engage policy-makers, teachers, institutional headmasters, researchers, educational technologies' creators and providers to collaborate on addressing the needs and issues that arise as AI's technologies are used in EFL learning and teaching.

5.4.4. Teachers' Response to AI Revolution: New Concerns and New Attitudes

This rapid advancement in technology, distinguishes ICT as protean, unstable, and opaque; changing rapidly and unstable in various ways that imposes different workings and usages to its users; therefore, attitudes vary too. Within this new AI tools the roles of teachers are challenged once again, and new demands emerged with the need to the attainment of new ICT competences to attain better outcomes and cater students' needs. Reactions towards these new trends and tendencies are confronted with new issues. It is paramount to consider their limitations.

It is said openly that though AI tools promise an avalanche of benefits, they cannot replace the role of the teacher because instructors hold crucial role in maintain interaction, motivation, engagement, and develop critical thinking Cohen (2023). Hence, constant up-to-date processes are needed. Once again, this asserts the need for up-to-date ICT training for better implementation of ICTs or rather state-of-the-art technological advancements into education in general and EFL context in particular.

Evidently, regarding ICT integration into EFL context and maintaining teachers' positive attitudes towards them it is requisite to provide ICT training for teachers. "Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a life time" and "If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people" The tow Chinese sayings better explain the importance of training for employees of any kind of organization. Training can be viewed as an investment not a cost. "Training aims to provide knowledge and skills and to inculcate the attitudes which are needed to perform specific tasks" (Buckley and Caple, 2009, p: 10). As Overman (1994: 62) observes, "what people hear they forget, what they see they remember, what they do, they understand".

5.5.Conclusion

To summarise, this chapter introduced a set of recommendations for ICT adoption into EFL context and maintaining teachers' positive attitudes. Throughout this chapter, the researcher outlined practical suggestions for the uptake of ICTs in teaching learning practices. Based on Koehlar and Mishra (2009) TPACK model of technology incorporation, teachers should be provided with adequate ICT training. The role of the trainers within ICT training programs is also determined. In addition, key fundamentals identified for the foundation of EdICT model for students to develop their ICT competence and skills for effective use of technology in their future education practices.

Chapter Six: Concluding Chapter

6.1. Introduction

6.2. General Conclusions of the Research: EFL Teachers' Attitudes towards the Use of ICTs into EFL Context

6.3. An Insight to the Study

6.4. Limitations

6.5. Further research suggestions

6.1.Introduction

This concluding chapter synthesises the key findings, resulting conclusions, and the emergent implications arisen throughout the research process. It critically evaluates the significance of this study and its contributions to the field of education. This chapter revisits the research questions, the research aim guiding the current research work, the chosen research methodological approach, and the encountered findings. It also acknowledges the limitations of the study and offers and suggestions for further research in this area.

6.2.General Conclusions of the Research: EFL Teachers' Attitudes towards the Use of ICTs into EFL Context

As expected, the findings of the study generally indicate that teachers hold a positive attitude towards the use of ICTs in education, their use in classrooms remains inadequate. Several key issues were identified as barriers to the full implementation of ICT, including limited accessibility of internet connection, lack of modern infrastructure, limited technical support, inadequate training, time constraints, rigid curriculum, traditional evaluation methods, and lack of teacher's competencies to use. Results also demonstrated that new and re-innovated training programs are required to permit teachers use ICT tools adequately and efficiently.

These findings align with Evans-Andris's (1995) review; highlighting that avoidance; integration, and technical specialisation are the three teachers' styles of computing use. Avoidance style is the most prevailing among because teachers who avoid using computers and spent less time on computer-related tasks, resulting in students' limited engagement and interaction with technology.

Conversely, teachers with integration style are those who integrate computers and technologies into their teaching methods, curriculum, daily instructional practices, and students' learning experiences. They also make use of a wide range of computer applications and computer activities by promoting creative, stimulating, and engaging projects. Based on their students' needs and curricular goals, they classify software drills and practices.

Along with, teachers holding technical specialisation style perceive computer and technology integration as a challenge. They consistently use computers in preparation and delivery of planned lessons. They demonstrate full integration of ICTs rather than supplementary use to traditional curriculum. They teach their students computers' technical aspects.

In light of this categorisation, the findings indicated that the majority of the teachers in this study exhibited integrated style, yet, an ongoing training is needed to achieve technical specialisation. Moving beyond the idea that attitudes can be pictured as simple object-evaluation associations, attitudes may be part of vast sets of knowledge structure (Fabrigar et al., 2005). To the broader sense of functionality, attitudes contribute in the adaptation to the environment (Eagly & Chaiken, 1998; Ajzen, 2001).

Additionally, a comprehensible research work has demonstrated interest toward the incentives for holding certain attitudes. Case in point, Katz (1960) as cited in Fabrigar et al., (2005) postulated that there are four classes of attitude functions: First, the knowledge function which implies that attitudes present a schema to make easy the management and simplification of information processing and by which to put together existing and new knowledge. Second, the utilitarian function which indicates that the fact of holding attitudes help individuals to attain desired goals and avoid negative outcomes that is attitudes serve to orient people toward approach or avoidance. Third, the ego-defensive function that can be associated with psychoanalytic principles; collocate with upholding or promotion of self-esteem. Fourth, the value-expressive function posits that attitudes could be a medium to convey information about individual's values and self-concepts. Understanding these functions, sheds light on their reasons why individuals may accept innovations such as ICT while others resist and reject them.

To reach these conclusions, the researcher conducted a careful investigation into EFL teachers' attitudes towards ICT use and examined the relationship between ICT integration into EFL context, teachers' attitudes, teachers' Perceived Usefulness, ICT Competence, social pressure, and ICT training. Adequate research approaches, data collection methods, and data analyses procedures were used to ensure both validity and reliability of the research findings.

6.3.An Insight to the Study

This study has examined the significant role of teachers' attitudes towards the integration of ICTs and their prevalence in educational settings into EFL educational context and precisely into EFL context has brought various facilities and services aimed at enhancing teaching.

However, despite the widespread success of ICT integration into EFL teaching/ learning, challenges persist in effectively integrating these educational technologies among teachers. Despite significant investments, there remains a disparity in their use. Teachers' perspectives and beliefs influenced by factors such as level of ICT knowledge and proficiency, institutional support, and training. Many questions have emerged to explore the relationship between teachers' attitudes and effective use of ICTs. This study aims at exploring these factors to shed light on the reciprocal interactions among teachers' attitudes, ICT integration in EFL context, ICT competence, teachers' Perceived Usefulness of ICTs, and ICT training.

Throughout this thesis, attitudes are discussed as intricate parameter in decision-making regarding technology adoption. Therefore, understanding these attitudes and their influencing factors is crucial for fostering the meaningful integration of ICTs and the development of effective technology-enhanced language learning environments.

To attain this aim, the following research questions are set forward:

1. What are the attitudes of EFL teachers at Ibn-khaldoun University of Tiaret towards the use of ICTs in EFL teaching and learning?
2. To what extent are ICT competence and ICT perceived usefulness likely to impact teachers' attitudes towards ICTs use?
3. To what extent are teachers generating differentiated models of teaching practices through the use of ICTs after Covid-19?
4. How does ICT training influence teachers' ICT use and their Continuing Professional Development (CPD)?

To answer these research questions, it is hypothesised that;

1. University EFL teachers are expected to have positive attitudes towards ICTs incorporation in EFL due to the educational affordances offered by digital technologies.
2. Factors such as ICT competence, Perceived ease of use of ICTs, and perceived usefulness are expected to have positive impact on University EFL teachers' attitudes and decision regarding technology-adoption.
3. The Covid-19 pandemic is anticipated to increase EFL teachers' adaptability, ICT competencies, and e-readiness to use digital technologies and resources in teaching practices.
4. ICT training is predicted to play crucial role in enhancing EFL teachers' professional skills and content knowledge thereby improving their attitudes towards ICT integration in teaching.

Insights obtained from investigating teachers' attitudes are significant for addressing the barriers and challenges encountered within the educational context. These findings can inform policy-makers and administrators about the need to invest in developing adequate ICT infrastructure, identifying the essential competencies necessary for efficient use of educational technologies and designing appropriate ICT training programmes.

The literature review provides an overview of the role of ICT in education and its significance in modern learning environments. It discusses how educational technologies have led to the emergence of new pedagogical in tertiary education, transforming teaching and learning practices. Additionally, it reviews the change of teachers' attitudes in response to these educational transformations and examining in detail the formation and functions of attitudes. Three notable technology adoption and diffusion theories are presented to form the theoretical framework for the present study which aims to explore teachers' attitudes towards ICT use into EFL context. The first theory discussed Ajzen's (1991) Theory of Planned Behaviour (TPB) which sheds light on the cognitive process underlying individuals' behaviours and their attitudes towards adopting a given system. Its main principles encompass: a) an individual's intention and willingness to engage in certain behaviour. This intention, respectively, is influenced by their salient beliefs about the attributes of the object attitude, ie., users' evaluative judgments about the outcomes of that behaviour, b) individuals' subjective norms and perceptions of what others expect

them to do, and c) their perceived behavioural control towards their ability in executing a behaviour .

The second discussed is Roger's (1995) Innovation Diffusion theory (IDT) which explains how individual's attitudes are influenced by a set of factors known as attributes of innovations. These attributes include relative advantage, compatibility, complexity, tiriability, and observability. The third theory discussed is Davis's (1989) Technology Acceptance Model (TAM) which focuses on users' Perceive Usefulness and Perceived Ease of Usefulness and case of use of technology. ICT training was described as a crucial factor for the uptake of ICT.

The methodology for this research study employs a mixed-methods approach, combining both quantitative and qualitative research methods. This approach was selected due to the exploratory nature of the research study, aiming to gain a comprehensive understanding of the phenomenon under investigation. By integrating elements from both designs the researcher aims to get the needed insights into EFL teachers' attitudes towards ICT. Quantitative and qualitative research methods were employed to collect and diversify data collection resources and reduce the possible encountered limitations associated with each approach. At procedural level, questionnaire was addressed to EFL teachers to gather quantitative data; interview was conducted with 1 year master's degree EFL students to gather qualitative data.

The questionnaire was designed and developed based on the existing literature and validated through a review of a panel of experts as well as a pilot test. It consists of eight sections and encompasses close- and open-ended questions. Similarly, the semi-structured interview protocol underwent the same validation process. The questionnaire was addressed online to 39 EFL teachers from the English department of Ibn-Khaldoun, Tiaret-University; selected through random sampling technique. The 34 responses of the EFL teachers determined the number of the sample of the current study. The semi-structured interviews were conducted with 15 EFL students of 1st year master's degree Didactics at the same department.

The data analysis for this study used both approaches descriptive analysis and qualitative content analysis. The former aims to describe and summarise the features of the data collected from the participants through the preparation and organisation of the data of

analysis. Google Forms was used as a means to collect data and store it to be regulated via the functions available within Google Sheets. The later was used through the description of data, pre-coding and coding, observation the growing ideas, and the interpretation of the data to draw conclusions.

The findings of the study revealed that EFL teachers generally showed positive attitudes towards the integration of ICTs in EFL. This positivity was reflected in the fact that the majority of teachers reported their use of ICTs in their teaching. The favourable attitude is associated with their positive perceive usefulness towards the educational outcomes offered by ICTs. Despite facing challenges such as the lack of technical support, adequate ICT infrastructure, and low internet connectivity, teachers remained inclined towards adopting these educational technologies in their teaching practices.

Results also indicated that while EFL teachers demonstrated basic computer and software skills, their overall ICT competence was relatively low. Their ICT knowledge was mainly limited to basic uses. This also shows a lack of comprehension regarding pedagogical understanding of technology integration into their learning and teaching practices. These results were supported by EFL students' responses which indicated that teachers made limited use of digital learning materials and resources. Despite these hindrances, EFL teachers expressed a strong appreciation for ICT training and for reforming the existing training programmes. Conclusions from the findings suggest EFL teachers maintain positive attitudes towards the use of ICTs into EFL teaching and learning, despite their limited ICT knowledge and training.

Based on the obtained data, it is recommended that policy-makers need to provide adequate ICT infrastructure and ICT training with continuous assessment and evaluation. Moreover, EdICT as a module for ICT education to students as future teachers was also suggested. Two parts should be addressed within this module; the theoretical phase and practical one where participants can have knowledge and put it into practice. All based on TPACK concepts and principles.

Joining this view, trainers' roles seem to be a key component for providing adequate ICT training programs. Therefore, a number of roles need to be fulfilled:

- ✓ Needs analysis through the use of interviews and questionnaires to identify the needed competencies,
- ✓ Content selection and development,
- ✓ Pedagogical knowledge development regarding the ways in which ICTs are included;
- ✓ Post-training's evaluation and feedback;
- ✓ Continuous improvement and research.

The roles mentioned above should be carefully considered by policy-makers when designing ICT training. With AI's evolution, providing ICT training only may not be efficient. Suggestions for the integration of AI tools and their implementation are also provided in the fifth chapter to ensure effective teaching performance and learning outcomes. In similar lines, the benefits of AI in EFL teaching and learning are also outlined. These recommendations serve as catalysts for maintaining positive attitudes among EFL teachers and ensuring the success for integration of ICT.

6.4.Limitations

As the research was conducted, the researcher encountered a number of limitations during data collection. First issue was linked to the limited control over external factors. Covid-19; as unforeseen event, affected the research process and data collection to a great extent. Unexpected changes occurred. Online learning/teaching became the mainstream in education. The total educational closure made it difficult to access to participations. Quarantine prevented the researcher to physically meet both teachers and students. Second issue was related to the sampling bias as the sample was limited to participants from the department of English in Ibn-khaldoun University of Tiaret. This may not be representative of the broader population of EFL teachers and students within the Algerian context. Therefore, the findings might not be applicable beyond the context of research in which it was carried out.

Another limitation was mainly related to financial issues and limited infrastructure of that Tiaret University where students face problems such as internet connectivity and access to computer. This could be a factor which limits the measurement of teachers' attitudes towards real use of ICTs. Additionally, time restrains the effective

implementation and validation of questionnaire's and interviews' items, using SPSS software. This latter would have provided reliable and valid tool.

6.5.Further research suggestions

Further studies could delve into various aspects uncovered in the present study. The main focus in this study was to determine what attitudes EFL teachers hold towards ICT use in EFL context and the influencing factors. It was the researcher's interest to find out correlations between these items and university EFL teachers and shedding light on the inclusion of ICT module into Didactics EFL students curriculum. Further studies can include other parameters and test other correlations

As it can be noticed, the scope of the study was narrowed to include university teachers and ICT training impact. These latter were gathered only from the responses reported by the teachers. In this vein, including a larger sample while focusing on other attitudes, expectations, and the ongoing process of teachers' development can be also explored. With AI tools' emergence and continuous technological advancements such as ChatGPT, ClassPoint AI, QuillBot, Formative AI, Education Copilot, etc., further research could continue to investigate teachers' attitudes and factors-related to ICT implementation to the other different levels of education. Experiments can be done to pre-test and post-test teachers' level of ICT competence before and after ICT training sessions. An ongoing needs analysis could be another field of research for ICT integration.

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APPENDICES

Appendix A: Panel of Experts

DR. Amina Abdelhadi	**Tiaret University**
Dr. Ghelamallah HMAIDIA	**Tiaret University**
Pr. Habib Yahiaoui	**Mascara University**

Appendix B: EFL Teachers' Questionnaire

You are kindly asked to answer a set of questions and take part of this research for the fulfilment of doctorate degree that aims to examine teachers' attitudes towards ICT in the process of teaching English as a foreign language (TEFL). Thank you for agreeing to participate in this study in advance. Responses and information will be handled with uttermost confidentiality.

1) Teachers' profile

1. Including this year, how long have you been teaching?

1 year 2-5 years 6-10 years 11-15 years 15+ years

2. Education background: what is your accomplished academic degree? Master degree, doctorate, professor
3. Area of expertise
4. Do you have any computer or information technology (IT) related certificate?
5. Have you ever taught ICT pedagogy as a subject specialty for didactic master's degree students?

2) Teachers' experience and Frequency of ICT Use and University Equipment

Statement	always	often	Sometimes	rarely	Never
1. I use ICT in your curriculum preparation. 2. I use ICT in the classroom through datashow. 3. I design online learning activities that require my students to work online. 4. I incorporate ICT in your lesson plan? 5. I search for course content's and materials' resources online.					

6. Does your current university provide you with technological appliances (such as overhead projectors, speakers) for classroom use with students? Yes ☐ No ☐
7. Is there any internet accessibility at your university?
   - If yes, how is it? -Excellent -Good -Fair -Bad

8. Have you ever used an online platform to conduct an online course?
   - If yes, how many times do you have your students connected in an online course?

     Once a week / tow times a week / one time a month / tow times a month / never
9. Do you regularly assign to your students assignments...?

   -Submitted via email

   - That require computer-based tasks
   - That involve online meetings and presentations
   - Other
10. How often do you discuss the use of technology in the classroom with colleagues in your university? -Daily -More than twice a week -from time to time - rarely -never
11. Does your university provide technical support?
    - All time - only when needed -never
    - If never, how do you solve these technical issues?

3) Training and support Availability to ICT integration

1. Do your university district and staff provide adequate Training to use technological resources and tools? Yes ☐ No ☐

If yes, for each of the following statements, please check "Yes" or "No".

Statements	Yes	No
1. I attended technology workshops, seminars, and sessions. 2. I participate in technology learning sessions at least once a month 3. I have been taught how to use many software applications 4. I have been taught how to design lessons using technology 5. I have been taught how to implement technology teaching pedagogies and methodologies 6. An educator model was brought to demonstrate how to use a specific software application. 7. I have been given time to practise what is learned during training sessions		

- The training's quality was:
  1) Effective 2) somewhat adequate but could be improved 3) insufficient

If no, I learned about ICT use by.

- Self- taught
- Reading books
- Seeking help from professionals
- Negotiations and collaboration with colleagues
- Being open to let from my students t
- Utilising online resources such as YouTube

4) Teachers' perceived usefulness

Please indicate the extent to which you agree or disagree with each of the following statements

Statement *I belief that the use of educational ICTs*	SD	D	N	A	SA
1. Increases the quality of learning and teaching 2. Facilitates teachers' work 3. Make learning/teaching enjoyable and stimulating. 4. Are useful instructional aids to address students' needs and concerns 5. Improve students' achievements and performances 6. Increases teacher-teacher, teacher-student, and student-student communication, involvement and engagement 7. Support teachers' creativity and productivity 8. Afford multiple course content resources 9. Underestimate the role of the teacher 10. Using technological devices in my classroom					

will only mean more work to me 11. Minimize students' interest in face-to-face classes 12. Reduce face-to-face classroom interaction 13. the use of technology is time and effort consuming (course preparation or content delivery)					

5) Teachers' perceived ease of usefulness (Reflects Teachers' levels of knowledge on ICT and expertise)

Please indicate the extent to which you agree or disagree with each of the following statements

Statement	SD	D	UD	A	SA
1. I have the basic Computer Literacies and skills 2. I have the basic software skills 3. I have sufficient knowledge about how to use computers and other devices in classrooms 4. I know how to use web applications and share them with students 5. I know how to adopt and adapt the appropriate technological learning tool to the content of a given course 6. I know when to use them 7. I know how to solve technical problems 8. Technological tools were difficult to use or understand 9. The use of technological applications makes me anxious 10. Working with computers frustrates me 11. I feel anxious if something goes wrong when I am using any technological tool					

6) Covid-19 as a Social influence and pressure to impact teachers' attitudes

Statement	SD	D	N	A	SA
Prior to Covid-19…….. 1) I was able to manage and use ICTs 2) I had positive attitudes towards these educational technologies? *During COVID-19……..* 3) It was easy for me to use online learning applications 4) We were forced to use educational technology 5) I was able to manage online discussions and students engagements 6) I was able to prepare interactive activities and engaging e-content 7) I was unable to choose the appropriate technological tool for my classroom (platform) 8) I was unable to manage, prepare and design online courses 9) I used only ready-made programs					

7) Post Covid-19 and Intention of Continuous Use of Digital Learning Technologies (DLTs)

Please indicate the extent to which you agree or disagree with each of the following statements

Statement	SD	D	N	A	SA

1. The use of DLTs increased my knowledge of pedagogies and content 2. The use of DLTs improves my performance in teaching 3. I intend to continue using digital tools of learning in my teaching					

8) ICT training (perceptions and beliefs)

Please indicate the extent to which you agree or disagree with each of the following statements

Statement	SD	D	N	A	SA
1. Knowing how to use ICTs is a worthwhile skill 2. I would like to increase my skills with computers and software. 3. I believe that training fosters teacher's ability to use technology in teaching/learning 4. I would like more opportunities to observe other teachers using technology. 5. I would like to attend more training workshops and seminars about technology integration in teaching/learning					

1. **To what extent do you think training facilitates the mastery of technology-related skills for successful digital learning tools' use and implementation in teaching?**
2. **According to you, what training opportunities should be provided for teachers to integrate technology effectively?**
3. **Would you like to add something?**

Appendix C: EFL Students' Semi-Structured Interview

1. Gender
2. Age
3. According to you, how do you see learning/teaching with technology?
4. Have your teachers include exposure to and use of technology in teaching and learning?
5. Do you attend online courses with your teachers?
6. Do you have an idea about teaching via technology?
7. Do your teachers offer a support to design lessons about how to integrate technology as a new paradigm?
8. Have Teacher of TEFL ever told you about how to teach via technology?
9. Do you have a module of ICT didactics?
   - If yes, your teacher of ICT taught you about....
     - How to use Excel
     - How to use PowerPoint presentations
     - How to store data
     - How to use options found in Microsoft Word Office
     - How to use and connect through email
     - How to use websites and search online for information
     - How to participate in an online course
     - Your ICT teacher gave you some examples about online applications and platforms
     - Your ICT teacher explained to you how to use technology to teach English
     - Your ICT teacher taught you about the new educational technology teaching approaches
     - Your ICT teacher has asked you to make an example of a lesson using technology
10. If no, do you have an idea about technology-enhanced language teaching and learning approaches?
11. Suggest some titles you studies in the module of TEFL
12. Suggest some titles you studies in the module of TEFL about technology-enhanced language teaching and learning

13. In general, do you think that you have received enough training about how to use ICTs in course design and teaching methodologies?
14. Would you plan to teach your future students online? Or via digital devices like overhead projector, English dictionary applications, e-books.

الملخص

تسعى هذه الدراسة إلى استكشاف مواقف معلمي اللغة الإنجليزية كلغة أجنبية تجاه استخدام تكنولوجيا المعلومات والاتصالات في تدريسهم استناداً إلى النظريات ذات الصلة لنظرية السلوك المخطط (1991) لأجزن (1991)، ونظرية نشر الابتكار (1995) لروجر (1995)، ونموذج قبول التكنولوجيا (1989) لديفيس (1989). وباستخدام نهج متعدد الأساليب، تستكشف الدراسة كفاءة المعلمين في مجال تكنولوجيا المعلومات والاتصالات، والفائدة المتصورة ، والضغط الاجتماعي، واحتياجات التدريب على تكنولوجيا المعلومات (PEoU) ، وسهولة الاستفادة المتصورة(PU) والاتصالات. تشير النتائج التي تم جمعها من استبيان تم إجراؤه على عينة عشوائية مكونة من 34 مدرس لغة إنجليزية يعملون في قسم اللغة الإنجليزية في جامعة تيارت، ومقابلة أجريت مع عينة ملائمة تشمل 15 طالبًا (EFL) كلغة أجنبية في نفس القسم خلال العام الدراسي 2022- (EFL) من طلاب السنة الأولى من ماجستير اللغة الإنجليزية كلغة أجنبية تجاه دمج تكنولوجيا المعلومات (EFL) 2023، إلى وجود مواقف إيجابية لمعلمي اللغة الإنجليزية كلغة أجنبية والاتصالات، ولكنها تكشف أيضًا عن انخفاض مستوى كفاءة تكنولوجيا المعلومات والاتصالات. وفي هذا الصدد، تؤكد الدراسة على ضرورة التدريب المحسن والمستمر لمعلمي اللغة الإنجليزية كلغة أجنبية في مجال تكنولوجيا المعلومات والاتصالات. وفي هذا الصدد، يتم توجيه التوصيات إلى صانعي السياسات والمعلمين؛ لتوفير تدريب كافٍ في مجال تكنولوجيا المعلومات والاتصالات؛ من حيث المحتوى والتواتر، ودمج وحدة تكنولوجيا المعلومات والاتصالات "تعليم في المناهج الدراسية استنادًا إلى نموذج التكنولوجيا والتربية ومعرفة (EdICT) "تكنولوجيا المعلومات والاتصالات بالنسبة لمعلمي المستقبل، يوصى بأن يركز المنهج الدراسي على دمج المناهج التعليمية مع .(TPACK) المحتوى التكنولوجيات المتطورة بما في ذلك الذكاء الاصطناعي في المقام الأول

Résumé

Cette étude vise à examiner les attitudes des enseignants d'anglais langue étrangère à l'égard de l'utilisation des TIC dans leur enseignement, en se fondant sur les théories connexes d'Ajzen (1991), la théorie du comportement planifié (TPB), la théorie de la diffusion de l'innovation (IDT) de Roger (1995) et le modèle d'acceptation de la technologie (TAM) de Davis (1989). Utilisant une approche mixte, l'étude explore les compétences des enseignants en matière de TIC, l'utilité perçue (PU), la facilité d'utilisation perçue (PEoU), la pression sociale et les besoins de formation en matière de TIC. Les résultats recueillis à partir d'un questionnaire administré à un échantillon aléatoire de 34 enseignants EFL travaillant dans le département d'anglais a l'Université de Tiaret, et d'un entretien mené avec un échantillon de commodité englobant 15 étudiants EFL de 1ère année de master en didactique dans le même département au cours de l'année universitaire 2022-2023 indiquent des attitudes positives des enseignants EFL à l'égard de l'intégration des TIC, mais révèlent également un faible niveau de compétence en matière de TIC. À cet égard, l'étude souligne la nécessité d'une formation améliorée et continue en matière de TIC pour les enseignants d'anglais langue étrangère. À cet égard, des recommandations sont adressées aux décideurs politiques et aux éducateurs pour qu'ils fournissent une formation adéquate en matière de TIC, en termes de contenu et de fréquence, et qu'ils intègrent un module de TIC, "Éducation aux TIC" (EdICT), dans le programme d'études sur la base du modèle Technologie, pédagogie et connaissance du contenu (TPACK). Pour les futurs enseignants, il est recommandé que le programme d'études se concentre sur l'intégration des approches éducatives avec les technologies en évolution, y compris principalement l'intelligence artificielle, l'IA en abrégé.