



People's Democratic Republic of Algeria  
Ministry of Higher Education and Scientific Research  
University of Saida, Dr. Moulay Tahar  
Faculty of Letters, Languages and Arts  
Department of English Language and Literature



**The effect of technology (mobile, computer, internet)**

**On EFL learners Memory Retention and Exam Success**

A thesis submitted as partial fulfillment of the requirements for the degree of *Master* in  
Didactics.

**Presented by:**

Miss. KARDAMOUCHE Israa Nadira

**Supervised by:**

Dr. GUERROUDJ Naima

**Board of Examiners**

|                     |              |                     |
|---------------------|--------------|---------------------|
| Dr. SENOUCI Mayada  | Chair Person | University of Saida |
| Dr. GUERROUDJ Naima | Supervisor   | University of Saida |
| Mrs. ADNANE Tahia   | Examiner     | University of Saida |

**Academic Year: 2024/2025**

## **Declaration of Originality**

I hereby declare that this dissertation is my own original work and has not been submitted previously for any degree or qualification. All sources and references used have been properly acknowledged.

## Dedication

I dedicate this thesis first to myself, for the strength, patience, and determination that carried me through every challenge.

✍ To my dear parents and siblings, whose endless love, encouragement, and support were the pillars of this journey, thank you for always believing in me.

✍ To my beloved uncle, Amar, who recently left us you were like a father and grandfather to me. Your care, your kind words, and your moral and financial support were with me from my earliest days to the final steps of this work. This achievement carries your name in every line.

✍ To my grandmother who passed away, whose prayers and love are still felt even in her absence.

✍ And to my grandmother who is still with us, your unwavering presence, love, and support meant everything to me May God bless you with a long and healthy life.

✍ To my friends and every soul who helped me, supported me, or stood by me during this journey your kindness will never be forgotten.

## **Acknowledgements**

I would like to express my sincere gratitude to my supervisor, Dr. GUERROUDJ, for her guidance and support throughout this research. I also extend my thanks to the jury members, Dr. SENOUCI (President) and Mrs. ADNANE (Examiner), for their valuable time and feedback.

Special thanks go to the teachers who kindly participated in this study, as well as all the instructors who offered assistance and encouragement during the preparation of this dissertation.

## Abstract:

---

### Abstract:

This dissertation investigates the effect of technology namely mobile phones, computers, and the internet on memory retention and exam performance among EFL (English as a Foreign Language) learners at Saida University Department of English. The research was prompted by the increasing integration of digital tools in education, especially after the COVID-19 pandemic. A mixed-methods approach was employed, combining both quantitative and qualitative methods to obtain a comprehensive view. Data were collected through three tools: a questionnaire answered by 47 Master One students specializing in Didactics and Civilization, semi-structured interviews with five teachers, and classroom observations. The quantitative data provided statistical insights into students' usage of technology and its perceived impact, while the qualitative data offered deeper perspectives from teachers' experiences and classroom behaviour. The findings revealed that technology plays a dual role in EFL learning. On one hand, it enhances accessibility to resources, increases motivation, and supports memory through visual and auditory aids. On the other hand, it may lead to distractions, reduce face-to-face interaction, and promote surface-level learning when not properly guided. The research also identified inconsistencies in how students engaged with technology and how seriously they approached the questionnaire. The study concludes that while technology has the potential to support memory retention and academic success, its effectiveness depends largely on the way it is integrated into the learning environment. The dissertation ends with practical recommendations for teachers, students, and institutions to encourage the purposeful use of digital tools in EFL education.

❖ **Keywords:** technology, memory retention, EFL learners, exam performance.

# Table of Contents:

---

## Table of Contents

|                                   |     |
|-----------------------------------|-----|
| <b>Declaration of Originality</b> | II  |
| <b>Dedication</b>                 | III |
| <b>Acknowledgements</b>           | IV  |
| <b>Abstract</b>                   | V   |
| <b>Table of Contents</b>          | VI  |
| <b>List of Tables</b>             | IX  |
| <b>List of Acronyms</b>           | X   |
| <b>List of Appendices</b>         | XI  |
| <b>General Introduction</b>       | 01  |

## Chapter One: Literature Review

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| 1.1 The Evolution of Technology in Language Learning                       | 03 |
| 1.2. definition of technology in Education and Its Effectiveness           | 04 |
| 1.3. The Smartphone and Its Growth                                         | 05 |
| 1.4. Computer-Based Learning                                               | 06 |
| 1.5. Hardware Devices                                                      | 07 |
| 1.6. E-Learning Platforms for Synchronous and Asynchronous Online Learning | 07 |
| 1.7. Internet-Based Learning                                               | 08 |
| 1.8. Traditional vs. Modern Teaching Methods                               | 09 |
| 1.9. Advantages and Challenges of Each Method                              | 12 |
| 1.10. Memory Retention in EFL Learning                                     | 13 |
| 1.10.1. Definition and Types of Memory (STM, WM, LTM)                      | 13 |

## Table of Contents:

---

|                                                       |    |
|-------------------------------------------------------|----|
| 1.10.2. How Technology Enhances Memory in EFL         | 14 |
| 1.10.3. Factors Influencing Retention in EFL Learning | 18 |

### **Chapter Two: Methodology And Framework**

|                               |    |
|-------------------------------|----|
| 2.1 Introduction              | 25 |
| 2.2 Research Approach         | 26 |
| 2.3 Research Design           | 27 |
| 2.4 Population and Sample     | 28 |
| 2.4.1 Student Participants    | 28 |
| 2.4.2 Teacher Participants    | 29 |
| 2.5 Research Setting          | 29 |
| 2.6 Data Collection Tools     | 30 |
| 2.6.1 Questionnaire           | 30 |
| 2.6.2 Interviews              | 31 |
| 2.6.3 Observation             | 32 |
| 2.7. Validity and Reliability | 32 |
| 2.8. Data Analysis Procedures | 33 |
| 2.9 Ethical Considerations    | 34 |
| 2.10 Conclusion               | 34 |

### **Chapter Three: Data Analysis and Interpretation**

|                                    |    |
|------------------------------------|----|
| 3.1 Introduction                   | 37 |
| 3.1.1SPSS Quantitative Analysis    | 39 |
| 3.1.2Thematic Qualitative Analysis | 40 |

## Table of Contents:

---

|                                                                                                                                  |    |
|----------------------------------------------------------------------------------------------------------------------------------|----|
| 3.2 Presentation and Interpretation of Questionnaire Results (Question 1 – 16, each reported with table, frequency, and comment) | 41 |
| 3.3 Challenges Faced by Learners in Using Technology                                                                             | 42 |
| 3.4 Interpretation and Discussion of Findings                                                                                    | 43 |
| 3.5 Summary of Key Results                                                                                                       | 59 |
| 3.6 Conclusion                                                                                                                   | 61 |
| General Conclusion                                                                                                               | 63 |
| References                                                                                                                       | 66 |
| Appendixes                                                                                                                       | 70 |

*Figure.1.* A sample for the table of contents (Adopted from a student's Master thesis)



## List of Tables:

---

### List of Tables:

| <b>Table</b>      | <b>Title</b>                                               |
|-------------------|------------------------------------------------------------|
| <b>Table 3.1</b>  | Student's Field of Study                                   |
| <b>Table 3.2</b>  | Preferred Study Method                                     |
| <b>Table 3.3</b>  | Weely Use of Technology for Studying                       |
| <b>Table 3.4</b>  | Most Frequently Used Devices                               |
| <b>Table 3.5</b>  | Tools Used to Aid Memory                                   |
| <b>Table 3.6</b>  | Student's Perception of Technology's Effect on Retention   |
| <b>Table 3.7</b>  | Most Effective Technology-Based Methods                    |
| <b>Table 3.8</b>  | Student's Technology-Based Retention Strategies            |
| <b>Table 3.9</b>  | Reported Challenges When Using Technology                  |
| <b>Table 3.10</b> | EFL Modules Where Internet Is Used                         |
| <b>Table 3.11</b> | Exam Grades per Module                                     |
| <b>Table 3.12</b> | Preparation Strategies for Exams Using Technology.         |
| <b>Table 3.13</b> | Impact of Technology on Exam Confidence                    |
| <b>Table 3.14</b> | Digital Platforms and Resources Used for Exam Preparation  |
| <b>Table 3.15</b> | Final Comments on Technology Use and Suggested Improvement |

*Figure. 2.* A sample for the list of tables according to APA guidelines (Adopted from a student's Master thesis)

## List of Acronyms:

---

### List of Acronyms:

|             |                                                |
|-------------|------------------------------------------------|
| <b>AI</b>   | Artificial Intelligence                        |
| <b>CALL</b> | Computer-Assisted Language Learning            |
| <b>CBT</b>  | Computer-Based Training (implied from context) |
| <b>EFL</b>  | English As a Foreign Language                  |
| <b>ESP</b>  | English for Specific Purposes                  |
| <b>LMS</b>  | Learning Management System                     |
| <b>LTM</b>  | Long-Term Memory                               |
| <b>SLA</b>  | Second Language Acquisition                    |
| <b>SPSS</b> | Statistical Package for the Social Sciences    |
| <b>STM</b>  | Short-Term Memory                              |
| <b>TEFL</b> | Teaching English as a Foreign Language         |
| <b>WM</b>   | Working Memory                                 |

## List of Appendices:

---

### List of Appendices:

| <b>Appendix</b>                     | <b>Page</b> |
|-------------------------------------|-------------|
| Appendix A: Students' questionnaire | 70          |
| Appendix B: Teachers' questionnaire | 72          |

# General Introduction:

---

## Introduction:

Technology has become a vital component of education today, influencing how students learn, recall information, and perform in class. In the context of English as a Foreign Language (EFL), digital instruments such as mobile phones, computers, and the internet have offered novel methods of teaching and learning. These tools enable students to get information quickly, use interactive platforms, and profit from multimedia materials. However, while technology has numerous benefits, it also poses significant obstacles in terms of memory retention and academic accomplishment. Memory is an important aspect in language learning because it enables students to retain, recall, and apply linguistic knowledge. With the increasing use of digital tools, there has been debate about whether technology improves or weakens students' ability to retain information. Some researchers argue that learning platforms, spaced repetition apps, and AI-based tutoring systems make learning more engaging and effective. Others, however, believe that relying too much on digital tools can lead to problems like digital amnesia (Google Effect), where students remember how to find information rather than the information itself, which might affect deep learning. In Algeria, the use of technology in EFL education has been gradually increasing, but the shift became more noticeable during the COVID-19 pandemic in 2020. At The University of Saida Dr. Moulay Tahar, Department of English for example, Master 1 English students specializing in Didactics and Civilization had to switch to online learning, digital assessments, and self-directed study using different online tools. This sudden change raises important questions about how technology impacts memory retention and exam performance among EFL learners at the University of Saida Department of English.

### 1. Statement of the problem

In recent years, technology has become an integral aspect of education, significantly transforming traditional teaching methods. EFL (English as a Foreign Language) learners increasingly rely on technological tools such as smart phones, computers, and the Internet to access learning materials, enhance their language skills, and prepare for assessments. While technology offers numerous advantages, its impact on cognitive processes, particularly memory retention and exam performance, remains a subject of debate. Some educators argue that digital tools promote engagement, facilitate access to diverse resources, and improve information retention. Others, however, believe that excessive reliance on technology leads to cognitive overload, distracts learners, and reduces deep processing of knowledge, ultimately affecting academic performance. Given the growing role of technology in education, understanding its effects on learning is essential.

# General Introduction:

---

## 2. Research Questions

The following research questions were addressed to examine how technological tools may affect EFL learners' memory retention and exam success

- a) How do technological tools such as Internet, mobile devices, and computers, influence EFL learners' memory retention and exam preparation?
- b) What types of technological tools and strategies are perceived to be most helpful in supporting memory and academic performance in EFL learning?
- c) What challenges do EFL learners face when using technology for studying and exam preparation and how can these challenges influence their academic outcomes?

## 3. Research Hypothesis

The current study is based on the following hypotheses:

1. The integration of technology in education can support EFL learners' memory retention and exam performance by offering accessible, interactive, and engaging learning tools.
2. Excessive reliance on digital tools may negatively affect memory retention and academic achievement by limiting deep learning and independent thinking.

## 4. Research Design:

This study follows a mixed-method explanatory design to ensure accurate and reliable results. By combining quantitative and qualitative approaches, the research provides a more comprehensive understanding of how technology affects EFL learners' memory retention and exam success. To collect data, three methods were used: a questionnaire for students, interviews with teachers, and classroom observation. The quantitative part involved a questionnaire distributed to Master One students at the University of Saida Dr. Moulay Tahar, Department of English, specializing in didactics and civilization. The questionnaire included multiple-choice and open-ended questions to assess the students' experiences, perceptions, and attitudes toward using technology in their learning process. The qualitative part consisted of two tools: semi-structured interviews and classroom observations. Semi-structured interviews were conducted with EFL teachers at the University of Saida Dr. Moulay Tahar, Department of English. These interviews aimed to explore teachers' opinions on how technology influences students' memory retention and exam performance. Additionally, classroom observations were carried out to provide direct insights into how technology was integrated into lessons and how students interacted with it during learning activities. The observations focused on identifying behavioral

## **General Introduction:**

---

patterns, engagement levels, and whether any challenges or difficulties related to the use of technological tools emerged during the lessons. Both interview responses and observation notes were analyzed using thematic analysis, where common themes and key ideas were identified. In short, this approach helps in gathering both numerical data from students' responses and detailed insights from teachers' experiences and real classroom practices, leading to a better-rounded analysis of the research problem.

### **5. Aims and Objectives of the Study**

With the rapid advancement of technology, education has seen many changes, especially in language learning. Nowadays, students rely on mobile phones, computers, and the internet for studying, which raises questions about how these tools affect their learning process. This study aims to explore how technology influences EFL students' memory retention and exam performance, considering both its benefits and challenges. To achieve this, the study will focus on the following objectives:

1. Understand how using mobile devices, computers, and the internet affect EFL learners' ability to retain information and perform in exams.
2. Compare traditional teaching methods with technology-based learning to see which one is more effective in helping students learn.
3. Explore students' and teachers' perspectives on using technology in education, including both positive and negative aspects.
4. Analyze how digital tools impact students' motivation, engagement, and comprehension in EFL learning.

By achieving these objectives, this study hopes to provide useful insights into the role of technology in language education and how it can be used effectively to improve students' learning experiences.

### **6. Significance of Study**

This study examines the role of technology specifically mobile devices, computers, and the internet in shaping EFL learners' memory retention and exam success. With the increasing integration of digital tools in education, it becomes important to explore how these technologies may influence students' cognitive processes and academic performance. By focusing on Master One English students at the University of Saida Dr. Moulay Tahar, Department of English, this research aims to provide insights into the use of technology-assisted learning in higher

## General Introduction:

---

education. Although several studies have investigated the impact of technology on language learning, there remains a need for research within the Algerian context to understand local experiences and challenges. This study adopts a balanced perspective by examining both the potential benefits and possible drawbacks of technology use, such as improved accessibility versus risks of distraction. It seeks to contribute to a broader understanding of how technology interacts with students' memory retention and academic success. The findings may offer useful information for educators, students, and researchers interested in the relationship between digital tools and language learning. Additionally, this study can serve as a foundation for future investigations on technology use in Algerian universities, without promoting any specific teaching approach.

Chapter One:

Literature

Review



**1.1.The Evolution of Technology in Language Learning:**

The integration of technology into language learning has undergone significant transformations over the decades. Before the arrival of digital tools, English as a Foreign Language (EFL) instruction primarily relied on traditional methods such as textbooks, memorization drills, handwriting, and direct teacher-centered instruction (Richards & Rodgers, 1986). Although effective to some extent, these methods often lacked interactivity and limited learners' exposure to authentic language use. The initial technological shift in language education appeared with audio-based tools in the mid-20th century. Cassette tapes, radio programs, and language laboratories offered students more opportunities to hear native speech and practice listening skills outside traditional classrooms. These methods aligned with the principles of exposure emphasized in Krashen's Input Hypothesis (1982), which stated that comprehensible input slightly above the learner's current level is crucial for language acquisition. By the 1980s and 1990s, the emergence of Computer-Assisted Language Learning (CALL) introduced interactive software and multimedia resources into EFL classrooms. Programs available on CD-ROMs provided grammar drills, vocabulary games, and pronunciation practice, offering learners a more autonomous and engaging experience (Beatty, 2003). According to Warschauer (1996), CALL represented a major pedagogical shift by promoting learner-centered instruction and fostering individualized learning pathways. The late 1990s and early 2000s witnessed the rise of internet-based learning platforms. The expansion of web technologies enabled the development of online forums, virtual classrooms, and educational websites, allowing students to interact with authentic materials and speakers worldwide. At the same time, the Cognitive Theory of Multimedia Learning proposed by Mayer (2005) emphasized that combining verbal and visual information enhances understanding and memory retention, supporting the growing use of videos, animations, and interactive activities in online EFL education. Advancements continued in the 2010s with the widespread use of smartphones, tablets, and mobile applications such as Duolingo, Quizlet, and Memrise. These tools applied principles from Ebbinghaus's (1885) Forgetting Curve by encouraging spaced repetition and continuous review, helping learners strengthen their long-term memory. Furthermore, developments in Artificial Intelligence (AI) introduced adaptive learning systems capable of personalizing content according to the learner's pace, offering immediate feedback, and simulating natural conversations through chatbots. Recent innovations have also explored the role of collaboration in learning, consistent with Vygotsky's Sociocultural Theory (1978), which underscores the importance of social interaction in cognitive development. Today's

digital platforms integrate peer discussions, collaborative tasks, and interactive exercises, making language learning a more dynamic and socially driven process. While these technological advancements have created unprecedented opportunities for improving language acquisition and memory retention, researchers continue to explore both their advantages and potential drawbacks. Excessive screen time, multitasking, and dependency on digital tools are concerns that merit further investigation, especially regarding their impact on cognitive processes and deep learning. In summary, the evolution of technology in language learning reflects a continuous effort to make education more accessible, interactive, and effective. Each stage from radio programs to AI-driven applications has contributed uniquely to reshaping how learners acquire and retain new languages. Although challenges remain, the strategic use of technology, when balanced with traditional methods, holds promising potential for supporting EFL learners' academic success in increasingly digital learning environments.

## **1.2. Definition**

### **1.2.1. Technology in Education and its Effectiveness**

"Productive skills, living things, and machines" is how Dusek (2006) described technology (p. 35). With its constant advancements, technology has altered teaching approaches and learning tactics in the modern day (Hollands & Escueta, 2020). Self-directed educational practice is made easier by the resources, possibilities, and educational contexts that technologies have created (Reinders & White, 2011). Using technology to suit their needs, language learners can experience language acquisition. EFL learners have many options to converse with native speakers in foreign language environments thanks to technology (Reinders & Benson, 2017). According to Reinders and Darasawang (2012), it is crucial that language learners become familiar with how to engage in technology-based language learning. Additionally, digital tools such as animation and hypermedia help provide meaningful contexts that facilitate comprehension (Butler-Pascoe, 1997, p. 20). This evolving integration of technology into education reflects a broader pedagogical transition toward learner-centered, interactive, and flexible learning environments. The inclusion of digital tools not only supports autonomy and real-time communication but also enhances comprehension through multimodal input. Recognizing and adapting to these advancements remains essential for maximizing their educational potential.

**1.3.The Smartphone and its Growth:**

A smartphone, according to Rysavy (2010), is a "clever" gadget that offers excellent communication services. It is also portable, interactive, user-friendly, and above all highly customizable. With the help of the many apps available on smartphones, students can produce and evaluate educational materials at any time and from any location (Connect, 2013; Sharples, Arnedillo-Sánchez, Milrad, & Vavoula, 2009). The ability of smartphones to commute makes them a good substitute for heavy laptops (Vinci & Cucchi, 2007). Smartphones are the perfect tool for students since they provide great options for eBooks and make it easier to do things like reading, reviewing, finding research articles, and taking notes (Lam, Lam, Lam, & McNaught, 2009). The smartphone is widely used, digitally personalized, and addictive. Because of the rapid speed of modern public life, people need convenient access to cutting-edge services and technology. Many of our everyday activities rely on the usage of cellphones, which have become essential for the majority of us. Like a Swiss Army Knife, a smartphone's capabilities facilitate a variety of activities, such as buying, communicating, listening to music, and navigating the internet (Rodrigues, Montague, Nicolau, & Guerreiro, 2015). The global smartphone market, whose shipments increased by 40% in 2013 to surpass 1 billion units, provides an indication of the impact that smartphones have on our lives (Weiss, 2015). Additionally, Weiss predicts that by 2018, there will be more than 2 billion smartphone connections, primarily driven by the two massive brands, Apple and Samsung. The PC and web-based computing ecosystems have been severely disrupted by the rise of smartphones. Smartphone users can now access services that were previously only available to computer users (Shin, Shin, Choo, & Beom, 2011). According to Wang, Xiang, and Fesenmaier (2014), smartphones change people's everyday life. In accordance with the same study, respondents preferred mobile phones to desktop and laptop computers for a variety of reasons, including better connection with friends and family, more information searches, finding out new apps, making use of their free time, and other small chores. This growing reliance on smartphones illustrates how digital mobility has become deeply embedded in both personal and academic routines. As access to learning resources becomes more immediate and versatile, the educational potential of smartphones continues to reshape how learners engage with information and manage their studies.

**1.4.Computer based learning**

As stated by Adams (2004), "any use of computer software for the purposes of supporting the process of learning" is referred to as computer-based learning (CBL). Likewise, the expression "computer-based learning environment" (CBLE) clarifies the software that students utilize and engage with during CBL. This encompasses any computer program, tool, or application that is created and intended to facilitate the study of a particular subject. Through active participation in a series of digital activities created with a pedagogical objective, CBL focuses on a learner's personalized self-study. CBL typically suggests that a teacher or facilitator is not present during the learning process. However, this does not imply that it is required to be used outside of the classroom. As a curriculum supplement to instruction, CBL frequently occurs in a classroom setting (Serin 2011; Adams 2004; Valdez et al. 1999). One essential feature of CBL that sets it apart from other forms of educational media, such as presentations, audio, and video, is interactivity. Iterative cycles of practice and reflection result from the learner's interactions with the digital learning environment, which provides feedback in return. CBLEs are typically made to offer several forms of interdependent representations in alongside nonlinear information and activity presentation in order to accommodate various learner types. Different CBL categories are found in the literature based on the learner's technology type and the degree of interaction between the learner and the digital environment. The following are some typical classifications that we found in the literature (Adams 2004; Hackbarth 1996; Serin 2011; Valdez et al. 1999). The concept of Computer-Based Learning (CBL) highlights the importance of interactive and personalized learning experiences. By engaging with digital environments, students are able to benefit from iterative cycles of practice and feedback, which facilitate deeper learning. The flexibility of CBL allows for various types of representations and nonlinear content delivery, catering to different learning styles. This adaptability ensures that CBL can function as both an independent study tool and a supplement to traditional classroom instruction, providing a dynamic and interactive learning experience. While computer-based learning emphasizes interactive engagement through digital platforms, the effectiveness of these learning environments heavily depends on the hardware devices that facilitate access. Understanding the role of these devices, along with the e-learning platforms they support, is essential to appreciating how modern education is delivered and experienced in both synchronous and asynchronous settings.

**1.5.Hardware Devices:**

All the e-learning platforms are multi-platform applications guaranteeing the possibility of use in different hardware devices including desktop, laptop, tablet, smartphone installed with different operating systems such as Windows, Android or iOS for learning specific tasks (Tropeal & Rango, 2020).

The e-learning architecture mainly has Server-side and Client-side 1) The Server-side devices include Database server, Application Server, Web-server that store learning content and other learning resources; 2) The Client-side devices include Desktop, Mobile devices such as Laptop, Netbook, e-Reader (Kindle, Nook, etc.), Tablet (iPad), smartphone (iPhone, Android, Windows), etc. Among mobile devices, the laptop and smart phone are especially very popular in online learning environments as those devices have become convenient devices with all required learning software possible to install.

**1.6.e-Learning Platforms for Synchronous and Asynchronous Online Learning:**

E-learning platforms increasingly serve important infrastructural features that enable instructors in higher education to provide students with effective learning and enhance interaction between instructors and students and amongst students themselves (Ferdousi & Levy, 2010). E-learning platform is a component of e-learning systems. The architecture of e-learning systems mainly contains the following components: an E-learning portal, Administration console portal, E-learning server running on the cloud platform, and Mobile devices such as laptop, smartphones, tablet, PC, etc. (Kirange&Sawai, 2021). Different e-learning platforms have become popular in higher education (Gonzalez et al., 2020) with commonly known e-learning management systems are: Canvas, Blackboard, Angels, etc. With user friendly and interactive user interface design, these platforms operate as an effective learning portal that allows students and instructors to interact confidently in different settings. The e-learning platforms have many useful features, such as announcement, discussion board for communications between instructor and students, doing assignments, taking quizzes, exams, posting grades, live Zoom meetings for fully online synchronous classes, casual meetings with students during office hours, etc. in the learning platform (Nogales-Delgado et al. 2020, Tropeal & Rango, 2020). Also, the class materials such as course syllabus, copies of lectures in the form of digital text, audio/video presentations are delivered to students live or recorded via the web. Online learning environments may also include students' class registration, and skillful mentoring by their advisor or instructor (Jena et al., 2017). In the e-learning systems platform, instructors can monitor students' activities in online class (Pandithurai et al., 2018)

as the platforms include tools for student tracking, their assessment, their direct participation, collaboration and communication in the discussion board. The design and deployment of instructional tools in e-learning platforms may vary based on the learning delivery mode in fully online classes. In the synchronous online classes, virtual live classroom set up must include a real-time communication platform as it allows students direct real-time interaction with their instructor and other students in class via video conference, use of an optional whiteboard as well as sharing of their computer screens (Zoom, 2022). In the asynchronous online classes, on-demand pre-recorded lecture video, demo, and other learning resources are uploaded in the learning platform that allows students to download and study those learning materials at their convenient time and place (Gonzalez et al., 2020). Modern e-learning relies on versatile hardware, with laptops and smartphones being key for access and usability. Combined with synchronous and asynchronous tools, platforms like Zoom and Blackboard enable flexible learning, real-time interaction, and efficient content delivery.

### **1.7.Internet-Based learning**

Internet-based learning, often referred to as online learning or e-learning, has been widely defined in educational literature. Ally (2004) describes it as “instruction delivered through the Internet using digital technologies, enabling learners to access materials at any time and from any location” (p. 5). Similarly, Rosenberg (2001) explains that e-learning refers to the use of Internet technologies to provide solutions that enhance knowledge and performance (p. 28). Khan (2005) emphasizes that “Internet-based instruction allows learning to occur regardless of time and place, supported by Internet tools” (p. 4). Naidu (2006) further defines online learning as a subset of distance education, involving both synchronous and asynchronous modes, utilizing Internet-enabled tools to facilitate learning (pp. 1–2). These collectively underscore the flexibility, accessibility, and technological foundation of Internet-based learning, which has become a transformative model in modern education.

**1.8.Traditional teaching method Vs Modern teaching method.****1.8.1. The traditional way of teaching and learning.**

Classrooms have been using teacher-centered instructional procedures for decades, which are referred to as traditional teaching approaches. The teacher serves as the main source of knowledge and authority in these approaches, which mostly rely on rote memory, direct instruction, and passive learning. Pupils must pay attention, take notes, and repeat or remember the material that is being taught. Written tests, dictation, textbook-based education, lectures, and repetition exercises are typical examples. There is frequently little contact in this model, and the classroom is structured in a strict way that leaves little opportunity for student autonomy or critical thought. Standardized examinations, grades, and right-or-wrong responses are frequently the main focus of assessment in traditional education, rather than in-depth comprehension or real-world application.

**Teacher-centered learning**

Traditional teaching is often characterized by a teacher-centered approach, where the instructor serves as the primary authority and the main source of knowledge in the classroom. Instruction is largely lecture-based, with students expected to listen and absorb information passively, typically through rote memorization (Richards & Rodgers, 2014). Textbooks are frequently the core instructional resource, and classroom interaction is limited—usually confined to teacher-led questions or clarification requests, rather than open discussion or peer collaboration (Darling-Hammond & Bransford, 2005).

This model reinforces a passive learning environment in which students are not encouraged to think critically or construct knowledge actively. Freire (1970) referred to this as the "banking model" of education, where learners are treated as empty vessels to be filled rather than as participants in a dialogic learning process. Furthermore, traditional instruction often follows a predetermined and inflexible curriculum, designed by educational authorities, with little consideration for individual learner needs, contextual factors, or current global developments. While this approach prioritizes efficiency and content coverage, it tends to restrict learner autonomy, creativity, and engagement. Instruction frequently follows a defined curriculum a preset and inflexible structure of content and delivery techniques specified by educational authorities or institutions in traditional educational contexts, especially within teacher-centered models. With little to no flexibility to modify lessons to meet the needs of each



student, local circumstances, or current events worldwide, this kind of curriculum usually places an emphasis on textbook-based education, rote memorization, and topic covering (Darling-Hammond & Bransford, 2005).

The emphasis on imparting theoretical and factual knowledge in a uniform way continues to be the main focus, which may cause a gap between classroom instruction and its useful, real-world applications. In these frameworks, students are frequently expected to memorize facts for tests without being prompted to consider the potential applications of that learning outside of the classroom. The lack of real-world application in fixed curricula is evident in several subject areas. For example, in EFL classrooms, students may spend extensive time memorizing grammar rules or vocabulary lists without engaging in meaningful communicative tasks that reflect authentic language use. Similarly, learners may be taught literary or historical content that is abstract and decontextualized, with little opportunity to connect it to their personal experiences or societal issues. Because it views knowledge as static material to be ingested rather than as dynamic information to be challenged, applied, or transferred, this method may hinder students' capacity for critical thought, motivation, and long-term memory. Additionally, the passive character of instruction in these systems frequently limits opportunities for problem-solving, active engagement, and the development of life skills, limiting the educational experience to exam performance rather than comprehensive learning.

Technology-based learning promotes interactive and student-centered education, where students are active participants rather than passive users of information, in contrast to the rigidity of fixed curricula. Students participate in peer feedback, self-paced activities, and real-time discussions via digital platforms such as mobile applications, virtual classrooms, and collaborative tools. Deep processing and memory retention depend on autonomy, motivation, and active language use, all of which are encouraged by this kind of learning. According to Alshahrani and Ally (2016), learners' performance in academic and real-world communication is enhanced by the interactivity of digital settings, which pushes them to solve problems, think critically, and use language skills in dynamic contexts.

Another major advantage of technology-enhanced instruction is the increased access to diverse, authentic learning materials. Unlike traditional textbook-based content, technological tools offer multimodal resources such as videos, podcasts, virtual simulations, and online articles that expose students to various accents, cultures, and language uses. For EFL learners, such exposure is crucial in building contextual understanding and improving retention. Video



simulations and real-life dialogues, for instance, enable learners to visualize grammar and vocabulary in use, making abstract concepts more concrete and memorable (Godwin-Jones, 2018).

This variety not only caters to different learning styles but also bridges the gap between classroom learning and real-world language application. Additionally, artificial intelligence and customized study plans are two ways that contemporary educational technology facilitates adaptive learning. Machine learning algorithms are used by platforms like Duolingo, Grammarly, and language-specific LMSs (Learning Management Systems) to evaluate learners' strengths, monitor their development, and modify content as necessary. These systems offer personalized exercise recommendations, give real-time feedback, and progressively raise task complexity in response to user performance. Students are thus consistently tested within their zone of proximal development, which improves learner confidence and retention. Because they may study at their own speed and concentrate on areas that most require development, personalized learning experiences also guarantee that students stay engaged (Alshahrani & Ally, 2016)

- To better illustrate the contrasting characteristics of traditional and technology-based approaches in EFL education and based on key pedagogical aspects. Traditional methods, often aligned with fixed curricula and teacher-centered philosophies, emphasize content delivery through lectures, textbooks, and rote memorization. In such contexts, students typically play a passive role, and the learning experience is uniform, exam-oriented, and limited in terms of real-world application. In contrast, technology-based learning introduces a more flexible, learner-centered environment that leverages digital tools to enhance interaction, engagement, and autonomy. Students are exposed to diverse and authentic resources, such as video simulations and virtual environments, which not only foster contextual understanding but also support long-term memory retention. Furthermore, advancements in artificial intelligence allow for personalized learning paths and adaptive feedback mechanisms that address individual learner needs more effectively. These differences highlight the pedagogical shift from traditional, content-heavy instruction toward dynamic, skill-oriented approaches that better align with modern educational goals.

**1.9.The Advantages and Challenges of each Method:**

The base of educational systems around the world has long been traditional teaching methods, especially when it comes to teaching English as a foreign language (EFL). With an excessive emphasis on lectures, textbooks, and rote memorization, these methods are typically teacher-centered and regimented (Richards & Rodgers, 2014; Harmer, 2007).

This approach's clear, regular framework is one of its main benefits; it aids students in developing self-discipline, time management skills, and a firm grasp of language norms, particularly those pertaining to grammar and vocabulary (Ur, 1996). For beginning students who need unambiguous teaching, teachers perform an authoritative role by guiding them step by step and offering direct, real-time feedback and correction (Brown, 2001).

Moreover, traditional classrooms often foster personal interaction and social bonding among students, which can contribute to emotional support and motivation. . But there are certain drawbacks to this approach. According to Kumaravadivelu (2006), it tends to encourage passive learning, in which pupils take in knowledge without actively participating in research or problem-solving. A one-size-fits-all strategy can overlook the differences in students' interests, learning styles, and speeds, which could end up in less creativity, less motivation, and less learner autonomy (Freeman, 2000).

Furthermore, students may perform quite well in grammar but suffer in communicative competence and the practical application of language abilities due to the strong emphasis on written exams and memorization (Richards & Rodgers, 2014). On the other hand, technology-based learning signifies a change toward learner-centered, interactive instruction that meets the demands of students in the twenty-first century. EFL classrooms are now dynamic environments that encourage adaptability, independence, and individualized learning experiences because to the incorporation of computers, mobile devices, internet platforms, and artificial intelligence (Gilakjani, 2017; Wang & Vásquez, 2012).

Podcasts, YouTube videos, e-books, simulations, and virtual exchanges are just a few examples of the many real-world resources that help students learn about other English dialects, cultures, and situations. Long-term memory retention depends on deeper cognitive processing and contextual learning, both of which are supported by these techniques. Additionally, learners can practice at their own pace, repeat material as necessary, and get immediate feedback thanks

to digital platforms and language learning apps. By creating customized study plans, responding to student progress, and providing practice problems and contextual explanations, AI-powered technologies such as ChatGPT further improve learning (Zawacki-Richter et al., 2019).

Nevertheless, there are challenges to using technology-based approaches. Especially in underdeveloped nations like certain parts of the country, not all students have equal access to digital resources or fast internet, which might exacerbate the educational divide (Warschauer, 2004).

Furthermore, social media or irrelevant content may divert the attention of the students, decreasing their concentration and time dedicated to language practice (Chen & Chen, 2012). Without direct instructor supervision, some students may struggle with motivation or time management, and a lack of regular classroom discipline and real-time face-to-face communication can create a sense of isolation (Blake, 2011).

Therefore, while technology brings many innovations to EFL teaching, its effectiveness depends largely on careful planning, teacher training, and ensuring digital equity. At the end, as Internet-Based Learning offers flexibility and accessibility, it also implies potential challenges related to technology use and learner autonomy, which may be relevant to learners cognitive processes.

## **1.10. Memory Retention:**

### **1.10.1. Definition of Memory (long term memory short term memory):**

It is commonly acknowledged that memory is an essential mechanism for learning and development and that it forms the basis of human intellect. In social, professional, and academic contexts, the ability to encode, store, and retrieve information is crucial. Baddeley (1997) defines memory as "the capacity to retain information over time" (p. 2), emphasizing its function in promoting behavior and long-term learning. Similarly, memory was defined as "the persistence of learning over time through the storage and retrieval of information" by Neisser (1967), a pioneer in cognitive psychology. These fundamental definitions emphasize memory's functional role in retaining knowledge and experience. Cognitive psychologists usually differentiate between short-term memory (STM) and long-term memory (LTM). Short-term memory is commonly characterized as the system that stores a little amount of information for a short period of time. Miller (1956) famously stated that STM may maintain "seven plus or minus two" items at simultaneously, whereas Sternberg and Sternberg (2016) state that STM

normally retains knowledge for 15 to 30 seconds unless rehearsal procedures are used. For instance, When an EFL student learns a new word like "umbrella" and uses it in a sentence such as "I carry an umbrella when it rains," they are more likely to remember it. Repeating the word and using it in context helps move it from short-term memory to long-term memory. Working memory is closely related to STM, as it refers not only to temporary storage but also to the manipulation of information for cognitive activities. Cowan (2008) defines working memory as "the portion of memory that is currently activated or in use" and believes that it is essential for reasoning, language understanding, and learning. . For example, when an EFL student mentally constructs a sentence using new vocabulary and grammatical structures, working memory is employed to retain and process the information in real time. Long-term memory (LTM) is a mechanism that maintains knowledge for longer periods of time, such as days, months, or even a lifetime. Atkinson and Shiffrin (1968) established the multi-store memory model, which requires information to transit through STM before reaching LTM via encoding processes such as repetition, organization, and purposeful application. Tulving (2002) later identified three categories of LTM: episodic memory (personal experiences), semantic memory (factual information), and procedural memory (skills and habits). In the context of EFL learning, when a student remembers how to conjugate verbs in the past tense or recalls vocabulary during a writing task, these actions are guided by LTM. Additionally, procedural memory allows learners to perform language tasks automatically, such as forming basic sentence structures or using common phrases fluently, without conscious effort.

Understanding how STM and LTM work is critical for creating learning settings that encourage long-lasting and meaningful knowledge. For example, employing spaced repetition, visual aids, and contextual language can help information migrate from short-term memory to long-term memory. In EFL schools, activities such as engaging in discussions, using grammar in writing, and continuously watching English movies help to encode and consolidate new language components into LTM.

Recognizing memory mechanisms, as well as how information is processed and retained, enables educators to help students achieve long-term retention and enhanced language competency. That all present a clear overview of memory systems and their relevance to EFL learning. By linking theoretical perspectives with practical language learning examples, they emphasize on the importance of understanding cognitive processes such as short-term, working, and long-term memory in language acquisition. This theoretical background sets the stage for examining how instructional methods can support memory retention in EFL contexts.

**1.10.2. How technology enhances Memory in EFL Learning.**

In modern EFL classes, technology improves memory retention and language acquisition by engaging both short-term and long-term memory systems through dynamic and multimodal input. Quizlet, Kahoot, and Duolingo use spaced repetition and retrieval practice techniques, which have been scientifically suggested to promote new vocabulary encoding and consolidation in long-term memory (Cepeda et al., 2006).

Furthermore, multimedia technologies like video simulations, interactive whiteboards, and audio recordings promote dual coding the combining of visual and verbal information which enhances the possibility that information is preserved in both verbal and visual memory pathways (Paivio, 1986). For example, an EFL learner watching a subtitled English video can link the pronunciation (audio), meaning (text), and visual context (picture), allowing for deeper encoding. Likewise, when using mobile flashcard applications like Anki, learners engage in spaced repetition, a method known to reinforce vocabulary retention by strengthening memory traces through repeated recall over time (Nation, 2013; Baddeley, 1997).

Furthermore, interactive grammar platforms such as Grammarly or Quill provide immediate feedback, allowing learners to process corrections, revise their input, and reinforce grammatical structures. This process engages working memory by requiring learners to manipulate and apply linguistic information in real-time (Cowan, 2008; Ellis, 2005).

These examples illustrate how technology can support memory functions—particularly working and long-term memory—when integrated effectively into EFL learning. Personalized learning paths provide learners with customized support based on their strengths and shortcomings, allowing them to process new material more meaningfully and retrieve it effectively during communication or testing settings. These technologies not only stimulate active participation, but they also alleviate cognitive overload by scaffolding challenging topics, resulting in improved academic performance and language retention. The integration of technology in EFL settings appears to support memory retention when aligned with cognitive learning principles. Learners often engage more deeply with content presented through interactive and multimodal formats, which may enhance their ability to process and retrieve language input. Such formats offer varied opportunities for meaningful practice without relying solely on traditional memorization, potentially aiding both understanding and long-term retention in a balanced and accessible manner.

**Types of memory in learning context:**

Understanding the nature of memory and its subtypes is critical for investigating how students learn, store, and recall a second or foreign language. Memory is commonly classified into three systems in educational psychology and cognitive science: short-term memory (STM), working memory (WM), and long-term memory (LTM). Each has a distinctive but interrelated role in second language acquisition (SLA) and is influenced by variables such as attention, prior knowledge, frequency of exposure, and instructional approach. These systems are critical in language acquisition situations for processing linguistic input, retaining vocabulary, comprehending grammar, and communicating effectively. Short-term memory (STM) is a temporary storage mechanism that stores an insignificant quantity of information for a short period of time, usually 15 to 30 seconds. According to Miller (1956), STM is limited to around seven (plus or minus two) objects at a time. In language learning, STM is especially critical for the early phases of input processing. For example, when a student hears a sentence in a foreign language, STM temporarily stores the phonological and lexical information until it is decoded and understood. If the sentence is long or complex, learners with limited STM capacity may struggle with retaining earlier portions of the statement while processing the latter parts. This constraint explains why starting learners frequently require shorter, more digestible input. Furthermore, STM is important in the early phases of vocabulary acquisition, when the learner retains novel word forms long enough to relate them to meanings via repetition or visual cues (Baddeley, 1999).

Working memory (WM) allows learners to hold and manipulate material simultaneously, whereas STM only stores information briefly. Baddeley and Hitch (1974) presented a multi-component model of working memory that included the phonological loop (for verbal information), the visuospatial sketchpad (for visual-spatial data), and the central executive (for attention coordination and task integration). Later versions included an episodic buffer to aggregate information from many domains (Baddeley, 2000).

Working memory is especially important in SLA (Second Language Acquisition) because language activities frequently entail active processing, such as remembering a sentence while digesting its grammatical structure or recalling many possibilities while selecting the correct verb form. Learners with higher WM capacity perform better in reading comprehension, grammar acquisition, and oral fluency tasks (Miyake & Friedman, 1998; Wen, 2016). In the classroom, WM is activated when students must listen to a verbal instruction, retain the

knowledge, and then do a related task, such as matching it to an image or interpreting a sentence. Furthermore, WM facilitates syntax acquisition, particularly in real-time phrase processing. For example, while reading the sentence "The boy who chased the dog fell," learners must retain the subject-verb relationship "boy–fell" while temporarily storing the embedded clause "who chased the dog." This type of complicated syntactic processing is more difficult for students with low WM resources, especially in real-time language use (Just & Carpenter, 1992).

In fact, WM capacity has been shown to predict performance in tasks such as idiom interpretation, dialogue turn-taking, and syntactic ambiguity resolution. Long-term memory (LTM) is the storage mechanism that allows information to be retained for extended periods of time, ranging from hours to a lifetime. Unlike STM and WM, LTM has a theoretically limitless capacity and stores data in a more ordered, structured manner (Atkinson & Shiffrin, 1968).

In the context of SLA, LTM stores vocabulary, grammatical rules, pronunciation patterns, and pragmatic information. LTM is often classified into explicit (declarative) and implicit (procedural) memory. Declarative memory contains semantic memory (facts, word meanings, grammatical rules) and episodic memory (personal experiences), whereas procedural memory includes skills and habits, such as the unconscious use of verb endings or pronunciation (Ullman, 2001).

Repetition, emotional salience, meaningful context, and active involvement all impact the process of storing information into long-term memory. For example, when students see the word "apple" frequently in visual, aural, and contextual modalities (flashcards, songs, dialogues), the lexical item gets lodged in their semantic memory. Similarly, as students practice speaking and get feedback over time, the ability to employ proper word order or pronunciation becomes procedural and natural.

These observations demonstrate the interconnectivity of memory systems in language acquisition and align with existing cognitive theories. The examples provided offer a realistic representation of how learners engage with language across different stages of memory, and the academic tone ensures the discussion remains neutral and evidence-based. This integration of theory and classroom application reflects current pedagogical understanding without imposing personal opinions or assumptions.



### 1.10.3. Factors Influencing Retention in EFL Learning

**Retention** The capacity to retain and recall learned information over time is a critical component in second or foreign language learning. According to Schacter (2001), “memory allows us to retain information over time and retrieve it when needed” (p. 5), which forms the foundation of effective learning. In the context of language acquisition, Ellis (2002) emphasizes that “successful language learning depends crucially on the ability to retain linguistic knowledge in long-term memory” (p. 143). Various psychological, pedagogical, and environmental variables influence how effectively EFL learners recall vocabulary, grammatical structures, and communication skills. Repetition, motivation, visual and auditory input, distraction, and teacher-led instruction are all significant factors in either promoting or hindering the retention process. Understanding how each of these elements functions provides valuable insights for optimizing instructional strategies and improving learning outcomes in EFL classrooms.

**Repetition:** Repetition is one of the most established mechanisms for memory consolidation in learning. Cognitive psychology emphasizes the importance of spaced repetition—repeated exposure to information over increasing intervals as a way to move content from working memory to long-term memory (Ebbinghaus, 1885/1913; Cepeda et al., 2006).

In EFL learning, repetition assists learners to get familiar with word forms, pronunciation, and grammatical patterns, notably in vocabulary acquisition. When a learner regularly hears or reads a term like “democracy” across multiple contexts—e.g., in news articles, during discussion in class, or in social media posts, the lexical item gets more firmly lodged in memory.

Furthermore, repetition encourages automaticity, allowing students to swiftly access linguistic structures without conscious effort. Nation (2001) emphasized that repetitive approaches such as choral repetition, dictation, flashcards, and digital review apps (e.g., Quizlet, Anki) are often used to reinforce memory traces. It is highlighted that learners must encounter a word at least 6-12 times in different settings in order to retain it well. apps (e.g., Quizlet, Anki) are commonly employed to strengthen memory traces.

**Motivation:** Motivation, both intrinsic (learning for personal growth or interest) and extrinsic (motivated by grades, rewards, or social acceptability), has a substantial impact on language



retention. Learners who are motivated are more likely to interact with learning materials, pay attention, and persevere in the face of difficulties (Dörnyei, 2001).

For instance, an EFL learner who intends to study abroad or connect with native speakers is likely to expend greater effort in preserving vocabulary and grammatical rules. Motivation influences not only the quantity but also the quality of language exposure, resulting in deeper cognitive processing and greater long-term memory (Schmidt, 1990).

Furthermore, emotionally charged motivation can improve retention via affective engagement. Krashen's (1982) Affective Filter Hypothesis states that learners with strong motivation and low anxiety recall more linguistic input because their mental "filter" does not interfere with information processing. Teachers can help motivate students by making knowledge relevant, assigning real-world activities, incorporating students' interests, and praising accomplishment. "It is important to consider that while motivation plays a significant role in language retention, the specific nature of motivation may vary greatly among learners, depending on individual goals, learning environments, and cultural contexts.

**Visual and Auditory Input:** Multimodal input, particularly visual and auditory modalities, can dramatically improve recall by targeting different cognitive processes. According to Dual Coding Theory (Paivio, 1986), combining verbal and visual representations results in two routes for memory retrieval, reinforcing learning. In EFL classrooms, combining spoken or written language with visual elements—such as images, videos, gestures, or diagrams—can greatly support learners in retaining new vocabulary and concepts. For instance, when introducing the word “rainforest,” a teacher might play a short video showing the sounds and scenery of a rainforest while describing its features. This multisensory approach helps learners connect the word with a vivid mental image and sound, making it easier to recall. Likewise, incorporating songs, storytelling, or role-play activities strengthens auditory memory, while visual tools like charts, flashcards, or illustrated notes serve as helpful memory cues. Research supports that learners retain more when taught through multimedia resources compared to text-only formats (Mayer, 2009).

**Distraction:** While repetition and motivation enhance retention, distractions can hinder it significantly. Distractions, whether internal (e.g., daydreaming, anxiety) or external (e.g., noise, mobile phone use), reduce the attentional resources available for processing language input. According to cognitive load theory (Sweller, 1988), working memory has limited capacity, and

extraneous distractions consume cognitive resources that should otherwise be used for learning. For instance distraction is one of the major obstacles to memory retention in EFL learning. When learners are surrounded by disruptions like background noise, constant movement, or digital distractions they may struggle to concentrate on the language input. For example, a student trying to follow grammar instructions while classmates chat nearby might miss key explanations, leading to poor retention. Similarly, switching between tasks like scrolling through social media during a listening activity limits focus and leads to shallow learning. To reduce such interference, teachers can design clear, engaging tasks, create a calm and organized classroom atmosphere, and promote student involvement throughout the lesson.

**Teacher-Based Instruction:** The role of the teacher in molding retention remains key, with emphasis on instruction quality, feedback, and classroom interactions. Teacher-based instruction, particularly traditional or teacher-centered techniques, frequently includes structured subject delivery, explicit grammar instruction, and guided practice. While such approaches may limit student autonomy, they provide constant, systematic exposure to linguistic forms, which promotes retention, particularly among novice learners (Richards & Rodgers, 2014).

Teachers influence retention through clarification, scaffolding, and reinforcement. When teachers introduce new vocabulary through relatable examples, revisit important ideas across different lessons, and regularly check students' understanding, they help strengthen learners' ability to process and recall information. Feedback—whether it's correcting mistakes or acknowledging accurate language use—also plays a key role in helping students reflect, adjust, and better remember structures.

However, for teacher-led instruction to truly support retention, it needs to be interactive. Passive lectures often result in limited engagement and weaker learning outcomes. By integrating strategies like open-ended questions, peer discussions, and hands-on practice, learners are more likely to stay involved and retain what they've learned. As Vygotsky (1978) stressed in his socio cultural theory, interaction with a more competent other (for example, the teacher) aids in the internalization of linguistic patterns, transferring them from short-term to long-term memory.

### **Transition to Technology's Impact on Memory Retention in EFL Learning**

The integration of digital tools into English as a Foreign Language (EFL) education has reshaped traditional instructional methods, influencing how learners process and retain language input. When applied with a clear pedagogical purpose, technology can facilitate memory retention by offering diverse input modalities, sustaining learner interest, and allowing instruction to be adjusted to individual needs. Learners now engage with materials through apps, virtual environments, and multimedia content, which often present information in a combination of text, images, sound, and movement. Mayer's (2009) Cognitive Theory of Multimedia Learning argues that memory is more likely to be retained when learners are presented with both visual and verbal stimuli, as it allows for dual-channel processing within working memory.

For example, a vocabulary app that combines narrated explanations with relevant animations may enhance learners' ability to associate meanings with words more effectively than traditional methods alone. In addition, spaced repetition and retrieval practice—two strategies widely acknowledged for supporting long-term memory (Cepeda et al., 2006)—are embedded in many digital platforms. Tools such as Anki or Quizlet automatically schedule reviews of vocabulary at optimized intervals to strengthen memory over time. Language learning platforms like Duolingo also integrate repeated exposure into gamified activities, encouraging learners to revisit material in a way that maintains motivation and supports gradual consolidation. Artificial intelligence (AI) and natural language processing tools such as ChatGPT offer learners the opportunity to simulate real-time communication, receive immediate corrective feedback, and adjust language difficulty based on their level. This personalization can reduce extraneous cognitive load and increase retention by making learning experiences more relevant and manageable (Kukulska-Hulme, 2012; Godwin-Jones, 2011).

Moreover, such tools promote active involvement, as learners are not merely passive recipients but can experiment with language in varied and meaningful contexts. Digital technology also enhances learner autonomy, encouraging individuals to take ownership of their progress. Instead of relying solely on classroom instruction, learners can explore topics, test their knowledge, and apply new language independently through interactive resources. This sense of agency is linked to deeper cognitive processing and more stable memory formation (Little, 1995).

Additionally, access to authentic materials—such as video lessons, online glossaries, subtitled media, and interactive dictionaries—exposes learners to language in realistic contexts, which supports contextual learning and aids long-term retention (Hafner et al. 2015).

Teachers also benefit from technology by using interactive tools like smartboards, mobile apps, and virtual classrooms to implement multimodal instruction. These tools allow educators to address diverse learning preferences and present content in ways that encourage sustained attention and reinforcement. Adaptive learning platforms such as Edmodo or Smart Sparrow monitor students' progress and tailor content difficulty to align with their proficiency, which helps manage working memory demands and prevents overload from unfamiliar material (Sweller et al., 2011).

Despite its benefits, the effectiveness of technology in enhancing memory retention depends largely on how it is implemented. Poor instructional design, excessive stimulation, and unregulated digital environments can lead to cognitive challenges. One such issue is split attention, where simultaneous stimuli—like pop-up notifications or background media—can divide learners' focus and reduce working memory capacity, ultimately hindering the encoding of new information (Carr, 2010; Kirschner & van Merriënboer, 2013).

Similarly, overdependence on external supports such as translation apps or predictive typing can lower the mental effort needed for learning, which is crucial for forming lasting memory connections (Mueller & Oppenheimer, 2014).

Research has shown that multitasking during digital learning activities often results in reduced comprehension and weaker retention. Additionally, when technological tools are introduced without proper instructional support or context, learners may experience cognitive dissonance or confusion, which disrupts memory formation. It's also important to note that the novelty of technology may give a false impression of effectiveness. Although learners may appear engaged due to interactive elements, this does not always translate into meaningful learning unless cognitive processes are actively engaged. Kirschner, Sweller, and Clark (2006) emphasize that unguided learning environments often fail to support novices, especially when cognitive scaffolding is missing. Moreover, repeated exposure to fast-paced multimedia may reduce opportunities for deep thinking and analysis, leading to superficial processing. This can be particularly problematic in language learning, where frequent practice, contextual repetition, and recursive reinforcement are critical for mastering vocabulary, grammar, and discourse structures (Ellis, 2002).

In summary, the role of technology in memory retention within EFL education is both promising and complex. When used strategically, digital tools can enhance engagement, promote deeper cognitive involvement, and support long-term retention through varied input and adaptive learning paths.

However, when applied without consideration of cognitive principles or learner needs, technology may result in distraction, shallow learning, or even hinder progress. The key lies in thoughtful integration where educators leverage digital tools not for their novelty, but for their potential to reinforce meaningful, structured, and personalized learning experiences. As such, technology in itself is neither wholly beneficial nor detrimental; its impact on memory retention depends on how it is aligned with sound pedagogical practices. This literature review has provided valuable insights into how technology influences EFL learners' memory and performance. The following chapter outlines the research methodology used to investigate these effects within a real educational setting.

# Chapter Two:

Methodology and  
frame work

## Chapter Two: Methodology and frame work

---

### 2.1. Introduction

The present chapter outlines the methodology employed to explore the impact of technological tools—specifically mobile phones, computers, and internet platforms—on English as a Foreign Language (EFL) learners' memory retention and academic performance. It presents a detailed overview of the research framework, including the approach, design, setting, participants, instruments, validity and reliability procedures, data analysis, and ethical considerations. The purpose of this chapter is to provide transparency and justification for each methodological decision made in this study, ensuring that the research adheres to academic standards and produces trustworthy, replicable results. In recent years, especially after the COVID-19 pandemic, technology has rapidly evolved and found its way into educational settings across all levels. Saida University, like many institutions, adopted various digital platforms to maintain instruction during lockdowns, which transformed traditional teacher-centered classrooms into tech-integrated environments. As learners became accustomed to tools such as Zoom, Moodle, WhatsApp, YouTube, and mobile apps, researchers became increasingly interested in how these changes affected cognitive processes like memory and exam performance in second language acquisition (SLA). Thus, the present study seeks to examine these effects from both a learner and teacher perspective, combining measurable data with experiential insight. To achieve this, a mixed-methods research approach was adopted, which aligns with Creswell and Plano Clark's (2018) recommendation for addressing multifaceted educational questions. The choice of this approach was further supported by Johnson and Onwuegbuzie (2004), who argue that combining both quantitative and qualitative methods allows researchers to explore not only observable patterns but also underlying meanings. This chapter proceeds by first presenting the research approach and design, followed by a description of the population and sample involved in the study. The research setting is then discussed, giving context to the case of Moulay Taher University in Saida. Each data collection tool—questionnaire, interview, and classroom observation—is described in detail, along with its purpose, structure, and justification for use. A discussion on the steps taken to ensure validity and reliability of findings is also provided, followed by the procedures used to analyze the data. Ethical considerations, including consent and confidentiality, are addressed toward the end of the chapter. Finally, the chapter concludes with a brief summary and transition to Chapter Three, where the findings will be presented and interpreted.

## Chapter Two: Methodology and frame work

---

### 2.2 Research approach

This study adopts a mixed-methods research approach, which integrates both quantitative and qualitative methodologies within a single framework. This approach was selected to provide a holistic understanding of how technology influences EFL learners' memory retention and exam success. The topic at hand involves measurable outcomes (e.g., frequency of technology use, exam performance) and individual perceptions and experiences (e.g., feelings of distraction, memory enhancement, and learning preferences), making a single-method design insufficient to capture the complexity of the research problem. Mixed-methods research has been widely recommended in educational contexts where both numeric trends and human interpretations are essential to answer the research questions. According to Creswell and Plano Clark (2018), mixed methods allow researchers to explore different dimensions of a topic and to triangulate findings to enhance the reliability and depth of the results. This approach is particularly appropriate for second language acquisition (SLA) studies that aim to bridge cognitive outcomes (such as memory retention) with social and instructional experiences (Reinders & Benson, 2017). In this study, quantitative data was collected through a structured questionnaire administered to 47 Master 1 students at Moulay Taher University in Saida. The questionnaire gathered data on students' frequency of using mobile phones, computers, and internet platforms for studying English, as well as their self-reported perceptions of how these tools affect memory and exam performance. On the other hand, qualitative data was obtained through five semi-structured interviews with teachers and classroom observations. These tools provided deeper insights into teachers' experiences, challenges, and reflections on integrating technology in the EFL classroom. Together, the two forms of data complement one another: quantitative results identify trends, while qualitative insights explain why those trends might exist. This research follows a convergent parallel mixed-methods design, where both quantitative and qualitative data were collected during the same phase, analyzed separately, and then merged during interpretation. This design allows for simultaneous investigation of learners' behaviors and instructors' beliefs, ensuring both breadth and depth of understanding. As illustrated in Creswell and Plano Clark's (2018) mixed methods typology, this design is one of the most effective when the researcher intends to validate or expand on quantitative results with qualitative insights. Moreover, this approach aligns with the pragmatic paradigm, which emphasizes the importance of using the most suitable tools to answer a research question, rather than committing to a single philosophical stance. As Johnson and Onwuegbuzie (2004) argue, pragmatism encourages flexibility in methodology and values both objective and subjective



## Chapter Two: Methodology and frame work

---

forms of knowledge. This perspective is ideal for research like the present study, which aims not only to measure student performance but also to understand the lived experiences of those involved in technology-enhanced learning environments. By adopting a mixed-methods approach, the current study ensures that the data collected is both statistically reliable and contextually meaningful, allowing for more accurate and comprehensive conclusions about the effects of digital technology on EFL learners' memory systems and academic.

### 2.3 Research Design

The research design is the structured blueprint that guides the planning, execution, and analysis of a study. For this research, a mixed-methods explanatory design was employed, combining both quantitative and qualitative methods to examine how technology impacts EFL learners' memory retention and exam success at Molay Tahar University in Saida Department of English. This choice of design allows the researcher to not only measure patterns of technology usage and academic performance but also to understand the reasoning and experiences behind those patterns through in-depth exploration. In the first phase, quantitative data was gathered using a student questionnaire. This tool aimed to identify general trends, such as how frequently students use digital devices for language learning and whether they perceive improvements in memory or academic performance. In the second phase, qualitative data was collected through semi-structured interviews with EFL teachers and through classroom observations. These tools were intended to provide contextual understanding of how technology is integrated into the classroom and how both students and teachers engage with it during the learning process. This design is classified as explanatory sequential in nature, though the actual data collection occurred in a mostly convergent parallel manner. While the data were collected simultaneously, the emphasis during analysis and interpretation was on using qualitative data to explain and expand on the quantitative findings. This methodological structure is especially valuable when the goal is to clarify why a pattern may exist such as why students who use YouTube for learning English might perform better in listening assessments, or why teachers observe differences in retention between digital and traditional methods. The three tools—questionnaire, interviews, and observation were selected based on methodological triangulation. According to Dörnyei (2007), triangulation enhances research reliability by comparing findings from multiple data sources. Each tool plays a different role in contributing to the overall picture: The questionnaire provides a broad, statistical overview. The interviews offer insights from experienced professionals directly involved in instruction. The observations give real-time data about student behavior and classroom interactions with technology.

## Chapter Two: Methodology and frame work

---

Moreover, this design is appropriate for the nature of the research sample. The students come from two distinct academic specialties Didactics and Civilization and may experience digital tools in different ways. Didactics students, for example, might rely more on interactive apps like Quizlet or Google Classroom for teaching practice, while Civilization students may engage more with digital libraries and YouTube documentaries for cultural analysis. Using both quantitative and qualitative methods enables the researcher to capture these differences meaningfully. In short, the mixed-method design not only allows for data complementarity but also supports a nuanced interpretation of findings. It is through this design that the study addresses its main objective: understanding the multi-layered influence of technology on memory, attention, and academic achievement among advanced EFL learners.

### 2.4. Population and sample :

The research was conducted with two distinct participant groups: (1) Master One students in the Department of English at Molay Tahar University in Saida, and (2) university teachers currently teaching courses in the Didactics and Civilization specialties. These participants were selected because they are directly involved in the process of learning and teaching English as a foreign language (EFL), and they actively engage with technological tools in their academic routines.

#### 2.4.1 Student Participants

The total population consisted of approximately 60 Master 1 students, from which 47 voluntarily completed the questionnaire and became the main source of quantitative data. These students were selected using a purposive sampling strategy, ensuring that participants had relevant experience using digital tools in educational contexts. This sampling technique is appropriate when the study requires participants with particular characteristics in this case, active EFL learners exposed to both traditional and technology-enhanced instruction (Dörnyei, 2007). Participants came from the two academic tracks offered in the department: Didactics, which focuses on language teaching theory and practice, educational psychology, and pedagogical methods. Civilization, which involves the historical, social, and political study of English-speaking cultures. These distinct specialties offer a valuable comparison point, as each type of learner may engage with technology differently. Didactics students are more likely to use teaching apps and grammar resources, while Civilization students may rely on video documentaries, e-books.

## Chapter Two: Methodology and frame work

---

### 2.4.2 Teacher Participants:

In addition to students, five university teachers from the same department were interviewed. All five were actively teaching at the Master One level in either Didactics or Civilization and were selected because of their experience with technology in the classroom. These teachers varied in professional background, with teaching experience ranging from 5 to over 15 years. The gender distribution was mixed, and all teachers had used at least one form of digital instruction in their teaching practice. The interviews provided qualitative data about instructional strategies, pedagogical attitudes, and perceived outcomes of using educational technology. This combination of student and teacher data was essential for methodological triangulation, ensuring the reliability of results by comparing observations from both ends of the educational spectrum (Cohen, Manion, & Morrison, 2018). It also helped ensure that student voices were contextualized within the instructional realities provided by the teachers.

### 2.5. Research Setting

The study was conducted at Molay Tahar University in Saida, a public higher education institution located in northwest Algeria. The research specifically focused on the Department of English, which offers programs across various disciplines including literature, linguistics, civilization, psycholinguistics, and didactics. The study involved Master One students enrolled in the Didactics and Civilization specialities during the academic year 2024–2025. This university was selected for its diverse student population, its ongoing integration of digital tools in teaching, and its experience with both traditional and online learning modalities. During the COVID-19 pandemic in 2020, Saida University like many institutions around the world was compelled to rapidly transition to online instruction. Platforms such as Google Classroom, Zoom, YouTube, WhatsApp, and Moodle became standard tools for teaching and learning during this period. The students and teachers involved in this research had thus experienced both remote and in-person instruction, providing a rich and balanced environment for examining the influence of technology on memory retention and academic performance. The Department of English at Saida University supports a blended learning philosophy, where technological tools are not seen as replacements for traditional teaching but as complementary assets. Lecturers frequently share lecture materials online, assign video-based homework, and integrate multimedia presentations in class using projectors and data show devices. These tools are particularly relevant in EFL contexts where visual, auditory, and interactive elements can enhance the learning experience (Reinders & White, 2010). Moreover, the stature of the

## Chapter Two: Methodology and frame work

---

department provides flexibility and autonomy for teachers to design their own course delivery methods, making it an ideal environment for exploring how different instructors incorporate or resist technology. Teachers in Didactics often apply tech-based pedagogical tools like PowerPoint, language learning apps, and online quizzes, whereas those in Civilization may use digital archives, podcasts, and video lectures to support historical and sociocultural content delivery. This variety supports the comparative nature of the current research, which examines how technology may affect learners in both academic streams differently. Lastly, the university's facilities and internet infrastructure were adequate to support the kinds of technology explored in the study. Classrooms were equipped with basic digital presentation tools, and the university library offered access to online journals and digital databases. Students often worked in computer labs or accessed online resources through their smartphones using mobile data particularly common in Algeria due to limited Wi-Fi coverage outside campus grounds. Given these institutional characteristics, Molay Tahar University in Saida represents a relevant and authentic case study setting for exploring how technology intersects with second language learning, memory retention, and exam performance in an Algerian higher education context.

### 2.6. Data Collection Tools

To collect the necessary data, this study used three primary instruments: a student questionnaire, semi-structured teacher interviews, and classroom observation. The combination of these tools reflects the triangulation principle in mixed-methods research, which aims to enhance the credibility and richness of findings by approaching the research problem from multiple angles. According to Creswell (2014), employing various instruments not only allows for the examination of general trends but also provides space to explore deeper perspectives and lived experiences. This combination of quantitative and qualitative tools is especially relevant in educational research where learner behaviours, attitudes, and performance must be interpreted in both measurable and contextual terms.

#### 2.6.1. Questionnaire:

The questionnaire was developed specifically for Master One students enrolled in the Didactics and Civilization specialties in the Department of English at Moulay Tahar University. Its purpose was to gather quantifiable data on the use of technological tools (e.g., mobile phones, computers, internet platforms) by students in their EFL learning practices, as well as their perceptions regarding memory retention and exam outcomes. Following Dörnyei (2007),

## Chapter Two: Methodology and frame work

---

who supports the use of structured questionnaires in second language research due to their practicality and scalability, the instrument combined multiple-choice, Likert-scale, and a few open-ended questions. This allowed the researcher to collect both numerical data and personal reflections in a single format. Topics included frequency of technology use, preferred tools for vocabulary learning or revision, and self-assessed impacts on concentration, recall, and exam preparation. A total of 47 students voluntarily participated in this phase. The questionnaire was administered during class hours to ensure a higher response rate, and clear instructions were given to minimize confusion. The anonymity of responses encouraged honesty, which is critical in self-reported data.

### 2.6.2. Interviews:

To complement the questionnaire data, semi-structured interviews were conducted with five university teachers who taught Master One students in either Didactics or Civilization. Interviews are widely regarded as one of the most effective tools for gathering rich, descriptive data. As Kvale (1996) suggests, the semi-structured format allows researchers to explore specific themes while also enabling participants to freely express their individual views. The main aim of these interviews was to explore how teachers perceive the role of technology in their students' memory development and academic performance. Guiding questions were developed based on the research objectives and literature, focusing on issues such as teaching strategies, student engagement, digital distraction, and differences between traditional and tech-based learning outcomes.

#### Example Interview Question (Used in This Study):

"Have you noticed any differences in students' memory retention when they use technology compared to traditional methods (books, handwriting, classroom lectures)?" Interviews were conducted in a quiet setting to ensure comfort and openness. Each session lasted approximately 15–25 minutes and was audio-recorded with consent. The recordings were later transcribed for analysis using a thematic coding process, which involved identifying key patterns, repeated ideas, and meaningful narratives across participants. The interviews added depth to the data by revealing how teachers' perceptions aligned—or conflicted—with students' self-reports. For example, while some students felt more independent using digital flashcards, one teacher observed that "students who rely heavily on phones often forget what they learned by the next class," highlighting the complexity of digital influence on memory.

## **Chapter Two: Methodology and frame work**

---

### **2.6.3. Observation:**

Classroom observation was the third tool used in this study to verify how technology was applied in real teaching situations and how students engaged with it. Observation is a direct data collection method that helps reveal behavioral patterns, environmental conditions, and authentic classroom dynamics particularly important when studying cognitive processes like attention and retention. As McMillan and Schumacher (2010) note, observation provides “non-intrusive insight” into the natural interactions that may not be accurately captured through self-reported tools. In this research, the observations focused on sessions where teachers integrated PowerPoint presentations, video content, interactive platforms, or smartphone-based activities. The researcher noted student behaviors such as: Level of focus and distraction during digital activities, Frequency of on-task vs. off-task behavior, Interaction patterns (e.g., active participation, question asking), Use of supplementary tech tools like Google Translate or dictionaries. Observation sessions were structured using an observation checklist and open field notes. Each session lasted 45 to 60 minutes, and at least one class per teacher was observed to ensure fairness. The notes were later analyzed thematically alongside interview responses to identify cross-validating trends. This tool played a triangulating role, verifying or challenging what students and teachers reported through questionnaires and interviews

### **2.7. Validity and Reliability**

To ensure the quality of the research, special attention was given to the validity and reliability of the tools and procedures used in this study. Validity refers to how well the tools measure what they are supposed to measure. In this study, content validity was considered while designing the questionnaire and the interview questions. The tools were created based on previous research and theories related to memory, technology use, and EFL learning. Before using the questionnaire, it was reviewed by two university teachers to check whether the questions were clear and related to the topic. Their feedback helped improve the final version and make sure the items were suitable for the participants. This process increased the content validity of the instrument (Fraenkel & Wallen, 2009). Reliability refers to the consistency of the results if the study were to be repeated. To improve reliability, the questionnaire included simple and direct questions that could be easily understood by the students. The interview questions were also written in a way that encouraged teachers to speak freely, while still staying focused on the main topic. During the observation, a consistent format was followed for taking notes to reduce personal bias. Also, the same researcher conducted all the observations and interviews, which helped keep the process stable and reliable. By following these steps, the

## **Chapter Two: Methodology and frame work**

---

study aimed to collect trustworthy data that accurately reflect the experiences of the participants with technology in EFL learning.

### **2.8. Data Analysis Procedures**

After the data were collected from the questionnaire, interviews, and classroom observations, each dataset underwent a systematic analysis process tailored to its nature (quantitative or qualitative). The goal of data analysis was to identify patterns, relationships, and insights regarding the role of technology in enhancing or impairing memory retention and exam success among EFL learners. This section outlines the analysis procedures applied to each research tool, along with the rationale for using them.

#### **2.8.1. Quantitative Data (Questionnaire):**

The responses from the students' questionnaire were analyzed using SPSS (Statistical Package for the Social Sciences). This software helped the researcher calculate basic statistics such as frequencies, percentages, and averages. These results made it easier to understand general trends like how usually students use technology in learning, and whether they believe it helps with memory and exam success. SPSS was chosen because it is widely used in educational research and provides clear and organized results (Pallant, 2016).

#### **2.8.2. Qualitative Data (Interviews):**

The information from the teacher interviews was analyzed using thematic analysis. This means that the researcher read through the interview answers carefully, identified common ideas or repeated points, and grouped them into categories or themes. This method is useful for discovering patterns in people's opinions and experiences (Braun & Clarke, 2006). It helped show what teachers think about the benefits and challenges of using technology in EFL classrooms.

#### **2.8.3. Observation Notes:**

The classroom observation notes were also analyzed thematically. The researcher looked at student behavior during the use of technology such as their level of focus, participation, and engagement. These notes helped support or contrast the data collected from the other tools. By combining both quantitative and qualitative analysis, the study aimed to give a complete and balanced view of how technology affects memory retention and academic performance in the



## **Chapter Two: Methodology and frame work**

---

EFL classroom. This triangulation across tools strengthened the internal consistency of the findings. When multiple data sources (e.g., teacher comments, student responses, and classroom behavior) pointed to the same conclusions, the results became more trustworthy.

This chapter described the research methodology used in the current study. It explained the research approach, the population and sample, the research setting, and the tools used to collect and analyze data. The study relied on both quantitative and qualitative methods to ensure a deeper and more reliable understanding of how technology affects EFL learners' memory retention and exam performance. By using questionnaires, interviews, and observation, the researcher was able to gather information from both students and teachers in a real academic context. The use of SPSS for data analysis and thematic coding for interviews and observations ensured that the results would be clear, organized, and meaningful. The next chapter will present and analyze the data collected from these instruments. It will discuss the main findings, compare them to previous research, and highlight important points related to the effect of technology on language learning and memory.

### **2.9. Ethical Considerations:**

All participants were informed about the purpose of the research and took part voluntarily. Informed consent was obtained before collecting data through questionnaires, interviews, and classroom observations. Anonymity and confidentiality were ensured, and participants were allowed to withdraw at any time without consequence. The study respected all academic ethical standards and did not cause harm or discomfort to any participant.

### **2.10. Summary and Transition**

In conclusion, this chapter outlined the methodological framework adopted for investigating the impact of technological tools on EFL learners' memory retention and exam performance at Moulay Taher University in Saida. A mixed-methods approach was employed to collect both quantitative data through student questionnaires and qualitative insights through teacher interviews and classroom observations. Each methodological choice was justified with reference to academic literature, and particular care was taken to ensure the validity, reliability, and ethical integrity of the research. The selection of participants, the structure of the data collection tools, and the procedures for analyzing the information were all explained in detail. This comprehensive methodology serves as a strong foundation for interpreting the findings of the study. The following chapter, Chapter Three, will present the analysis of the data collected,



## **Chapter Two: Methodology and frame work**

---

highlighting the key patterns, themes, and insights that emerged from students' and teachers' experiences with educational technology, and discussing their implications for memory retention and academic success in EFL learning.

# Chapter Three:

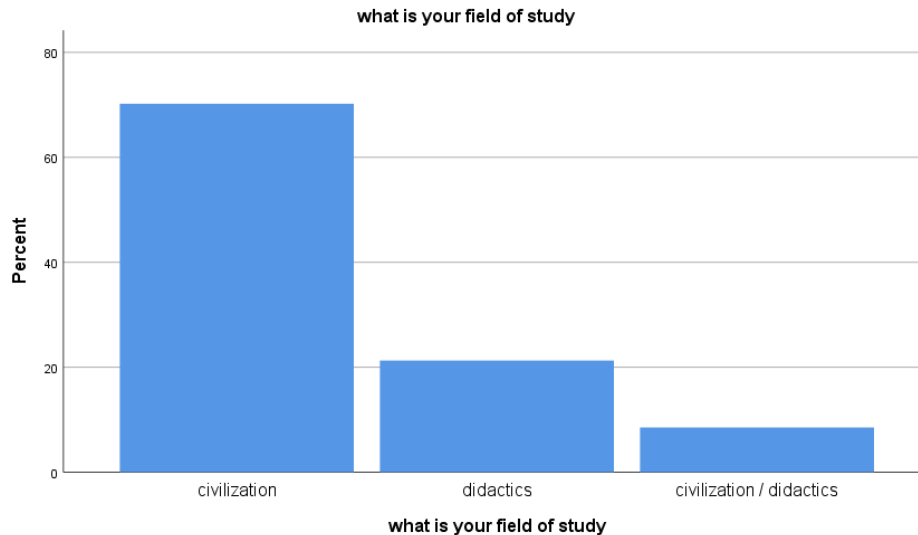
## Data Analysis and Interpretation

**3.1. Methods and Tools Used in the Study:****3.1.1. Data Analysis Method with SPSS V 25:**

The data collected from the questionnaire were analyzed using **SPSS Version 25** (Statistical Package for the Social Sciences). The software was chosen for its advanced statistical capabilities and user-friendly interface. After collecting responses from **47 participants**, the data were first coded and entered into SPSS. Descriptive statistics (such as frequencies and percentages) were used to summarize the participants' responses to both closed and open-ended questions. Cross-tabulations were also applied to identify relationships between variables such as field of study, preferred study method, and the impact of technology on memory retention and exam performance.

**The answers of the participants to the questionnaire items:**

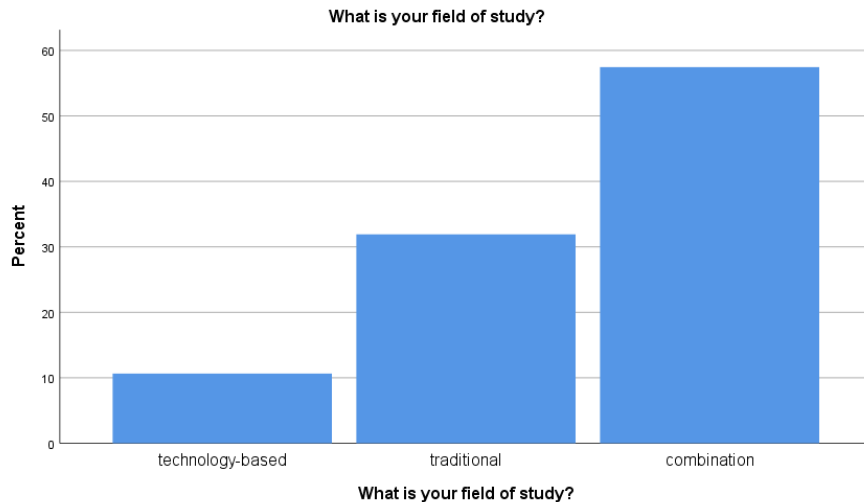
| 1/- what is your field of study |           |         |
|---------------------------------|-----------|---------|
|                                 | Frequency | Percent |
| civilization                    | 33        | 70,2    |
| didactics                       | 10        | 21,3    |
| civilization / didactics        | 4         | 8,5     |
| Total                           | 47        | 100,0   |



### Analysis:

Most of the participants, about 70%, study Civilization. Around 21% study Didactics, and a few, about 8%, study both fields. This shows that most of the students in this sample come from the Civilization field. Knowing this helps us understand their answers better because their background can affect how they think about the topics in the study.

| 2/- What is your field of study? |           |         |
|----------------------------------|-----------|---------|
|                                  | Frequency | Percent |
| technology-based                 | 5         | 10,6    |
| traditional                      | 15        | 31,9    |
| combination                      | 27        | 57,4    |
| Total                            | 47        | 100,0   |

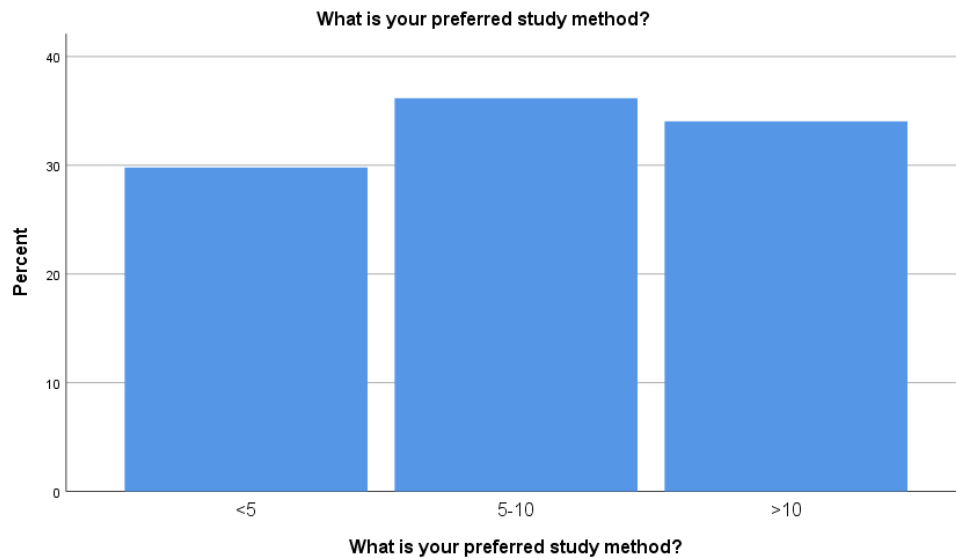


### Analysis:

The results show that most students, about 57%, prefer a combination of technology-based and traditional study methods. About 32% use traditional methods only, while only around 11% rely mainly on technology-based study. This suggests that combining both methods is the most popular approach among the students, possibly because it helps them benefit from both digital tools and conventional learning styles.

3/- What is your preferred study method?

|       | Frequency | Percent |
|-------|-----------|---------|
| <5    | 14        | 29,8    |
| 5-10  | 17        | 36,2    |
| >10   | 16        | 34,0    |
| Total | 47        | 100,0   |

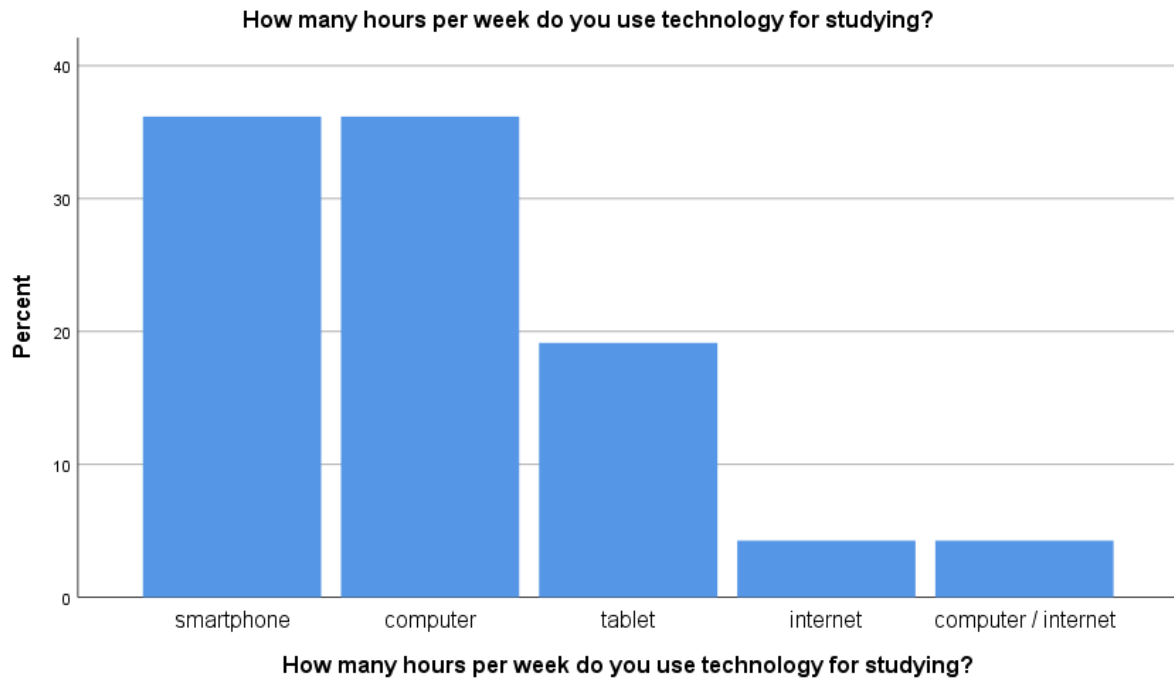


### Analysis:

The data shows that the students use technology for studying in different amounts of time each week. About 30% of the students use technology for less than 5 hours per week. The largest group, around 36%, uses it between 5 and 10 hours, and about 34% use technology for more than 10 hours per week. This indicates that most students spend a moderate to high amount of time using technology for their studies.

4/- How many hours per week do you use technology for studying?

|                     | Frequency | Percent |
|---------------------|-----------|---------|
| Smartphone          | 17        | 36,2    |
| computer            | 17        | 36,2    |
| tablet              | 9         | 19,1    |
| internet            | 2         | 4,3     |
| computer / internet | 2         | 4,3     |
| Total               | 47        | 100,0   |

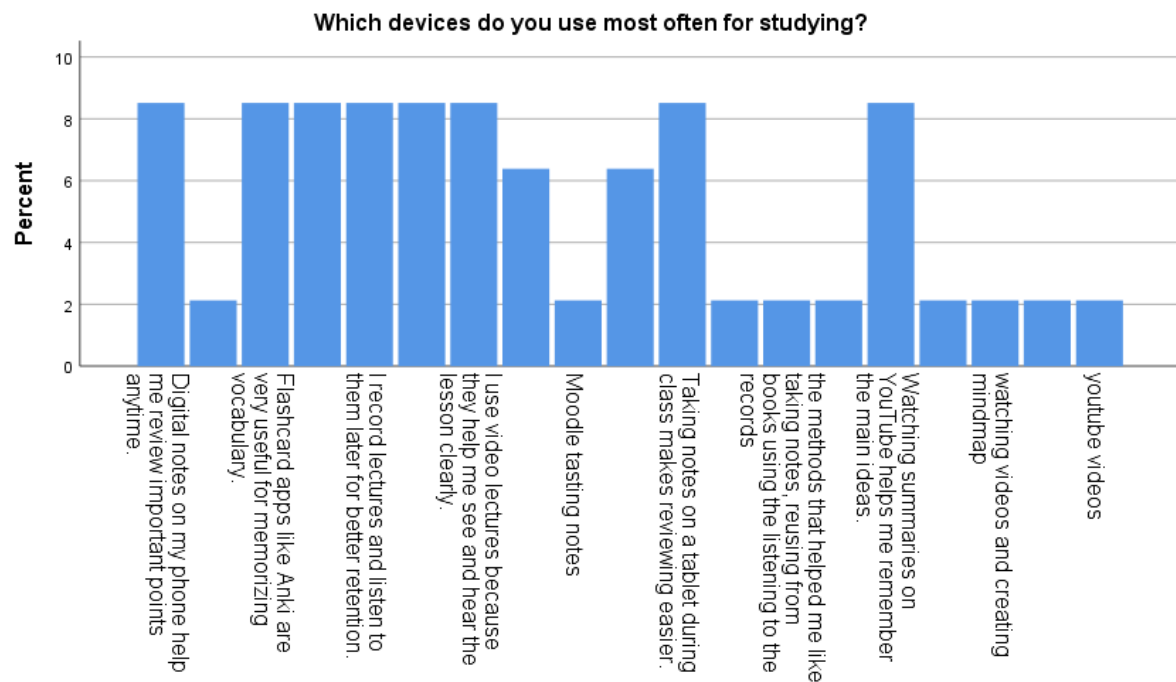
**Analysis:**

The results show that the most used devices for studying are smartphones and computers, each used by about 36% of the students. Tablets come next, used by around 19% of participants. Only a small number of students use the internet alone or a combination of computer and internet, each representing about 4% of the sample. This suggests that mobile and computer devices are the main tools for studying among the students.

## 5/- Which devices do you use most often for studying?

|                                                                                                     | Frequency | Percent |
|-----------------------------------------------------------------------------------------------------|-----------|---------|
| Digital notes on my phone help me review important points anytime.                                  | 4         | 8,5     |
| download apps that I take notes on                                                                  | 1         | 2,1     |
| Flashcard apps like Anki are very useful for memorizing vocabulary.                                 | 4         | 8,5     |
| I create mind maps using apps to connect ideas visually.                                            | 4         | 8,5     |
| I record lectures and listen to them later for better retention.                                    | 4         | 8,5     |
| I use online quizzes to test my knowledge repeatedly.                                               | 4         | 8,5     |
| I use video lectures because they help me see and hear the lesson clearly.                          | 4         | 8,5     |
| I use voice memos to record important explanations.                                                 | 3         | 6,4     |
| Moodle tasting notes                                                                                | 1         | 2,1     |
| Online discussion forums help me clarify doubts and remember better.                                | 3         | 6,4     |
| Taking notes on a tablet during class makes reviewing easier.                                       | 4         | 8,5     |
| Taking screenshots and reviewing later                                                              | 1         | 2,1     |
| the methods that helped me like taking notes, reusing from books using the listening to the records | 1         | 2,1     |
| the use of phones, taking notes                                                                     | 1         | 2,1     |
| Watching summaries on YouTube helps me remember the main ideas.                                     | 4         | 8,5     |
| Watching summary videos                                                                             | 1         | 2,1     |
| watching videos and creating mind map                                                               | 1         | 2,1     |
| watching YouTube videos which explain                                                               | 1         | 2,1     |
| YouTube videos                                                                                      | 1         | 2,1     |
| Total                                                                                               | 47        | 100,0   |



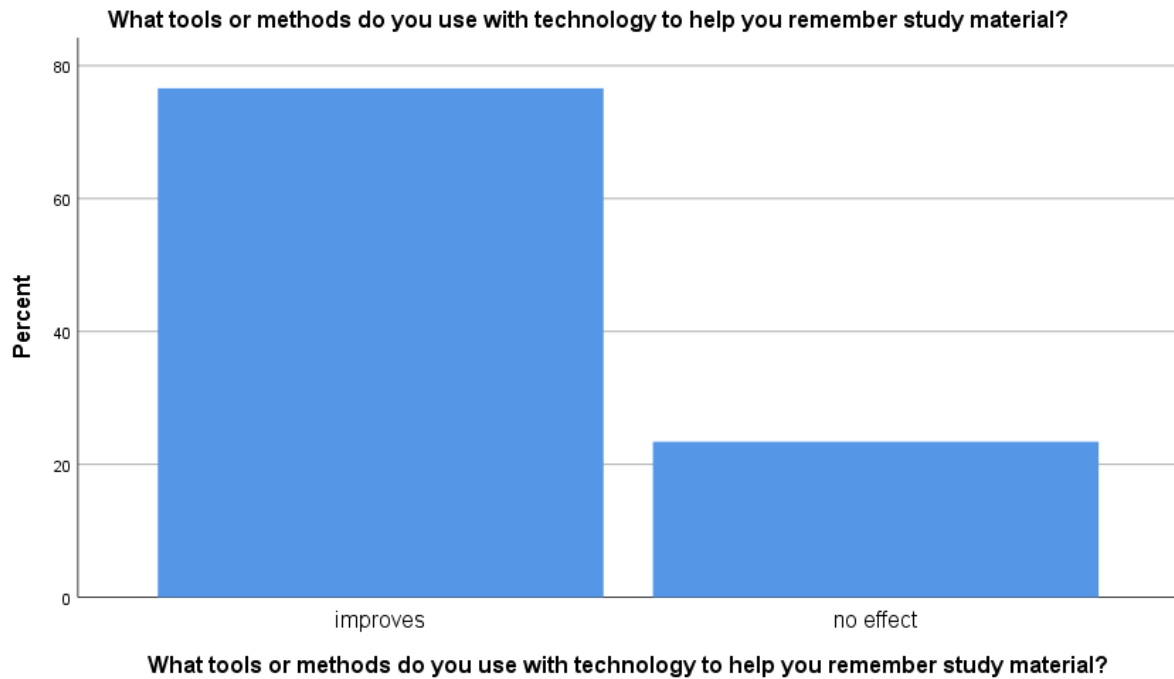


### Analysis:

The participants use a variety of technology tools to help with studying and memory retention. Many students (about 8.5%) reported using digital notes on their phones, flashcard apps like Anki, mind map apps, recording lectures, online quizzes, video lectures, taking notes on tablets, and watching summaries on YouTube. Smaller groups use voice memos, online discussion forums, and other methods such as Moodle notes or screenshots. Overall, it shows that students rely on different digital tools, especially those that allow them to review and repeat information easily.

6/- What tools or methods do you use with technology to help you remember study material?

|           | Frequency | Percent |
|-----------|-----------|---------|
| improves  | 36        | 76,6    |
| no effect | 11        | 23,4    |
| Total     | 47        | 100,0   |

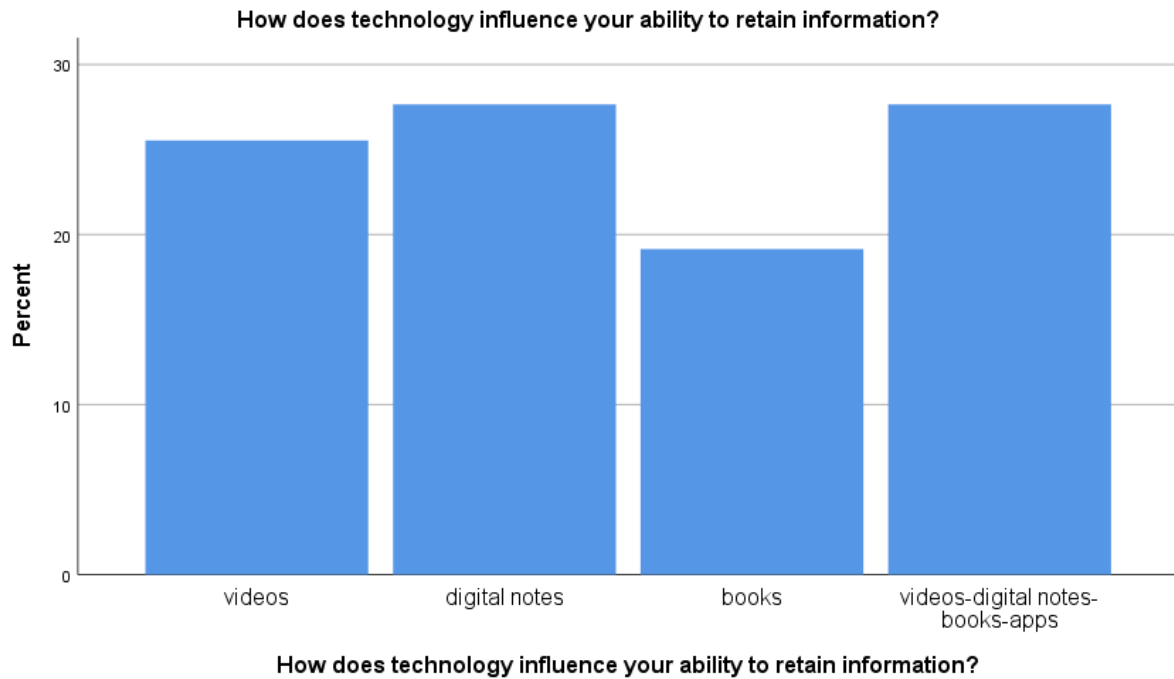


### Analysis:

Most of the students, about 77%, believe that technology helps improve their ability to remember study material. However, around 23% feel that technology has no effect on their memory retention. This shows that while technology is generally seen as beneficial for learning, a smaller group of students may not experience the same advantages.

7/- How does technology influence your ability to retain information?

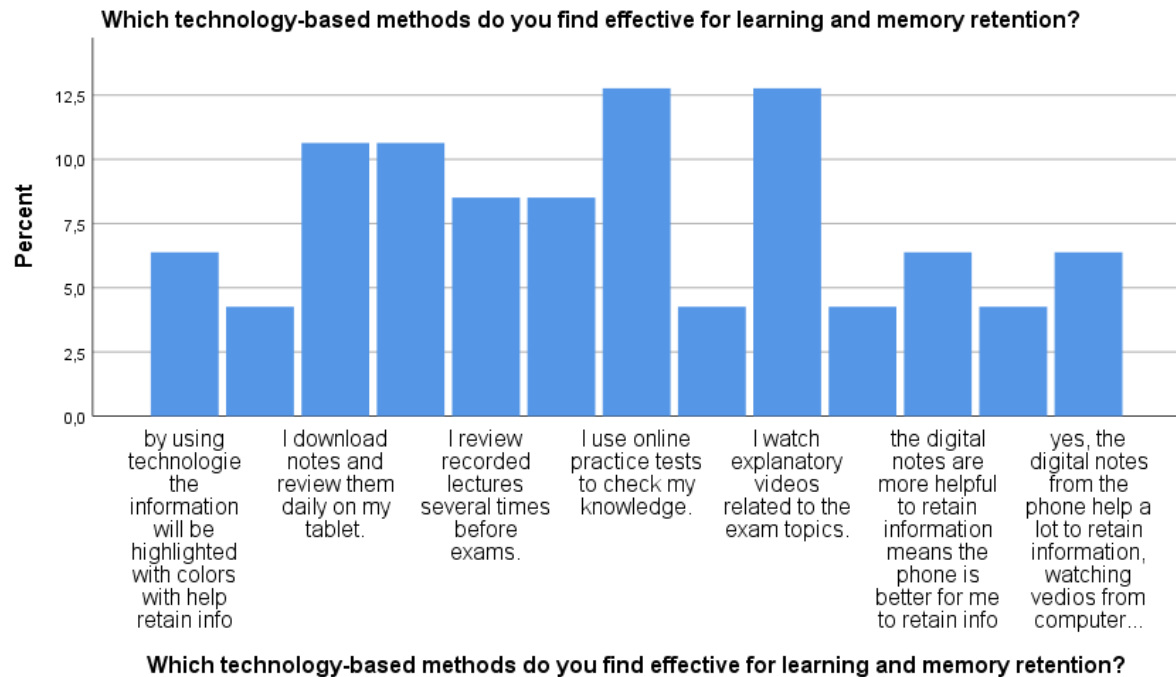
|                                 | Frequency | Percent |
|---------------------------------|-----------|---------|
| videos                          | 12        | 25,5    |
| digital notes                   | 13        | 27,7    |
| books                           | 9         | 19,1    |
| videos-digital notes-books-apps | 13        | 27,7    |
| Total                           | 47        | 100,0   |

**Analysis:**

The data shows that students use different technology-based methods to help retain information. About 28% rely on digital notes, while another 28% use a combination of videos, digital notes, books, and apps. Videos alone are used by approximately 26% of the students, and books by about 19%. This variety indicates that students prefer a mix of tools to support their learning and memory retention.

8/- Which technology-based methods do you find effective for learning and memory retention?

|                                                                                                                 | Frequency | Percent      |
|-----------------------------------------------------------------------------------------------------------------|-----------|--------------|
| by using technologies the information will be highlighted with colors with help retain info                     | 3         | 6,4          |
| digital notes are easy to access and easy to use                                                                | 2         | 4,3          |
| I download notes and review them daily on my tablet.                                                            | 5         | 10,6         |
| I join online groups where we discuss exam questions.                                                           | 5         | 10,6         |
| I review recorded lectures several times before exams.                                                          | 4         | 8,5          |
| I use apps that provide flashcards and quizzes to prepare.                                                      | 4         | 8,5          |
| I use online practice tests to check my knowledge.                                                              | 6         | 12,8         |
| I was preparing for psycho pedagogy exam and i used digital mind map to summarize the lecture                   | 2         | 4,3          |
| I watch explanatory videos related to the exam topics.                                                          | 6         | 12,8         |
| sometimes i find teachers that explain the lesson better and also provide a Bain map that facilitate memorizing | 2         | 4,3          |
| the digital notes are more helpful to retain information means the phone is better for me to retain info        | 3         | 6,4          |
| watching a videos gives me a simple explanation of the lecture, this helps me to understand it                  | 2         | 4,3          |
| Yes, the digital notes from the phone help a lot to retain information, watching videos from computer...        | 3         | 6,4          |
| <b>Total</b>                                                                                                    | <b>47</b> | <b>100,0</b> |

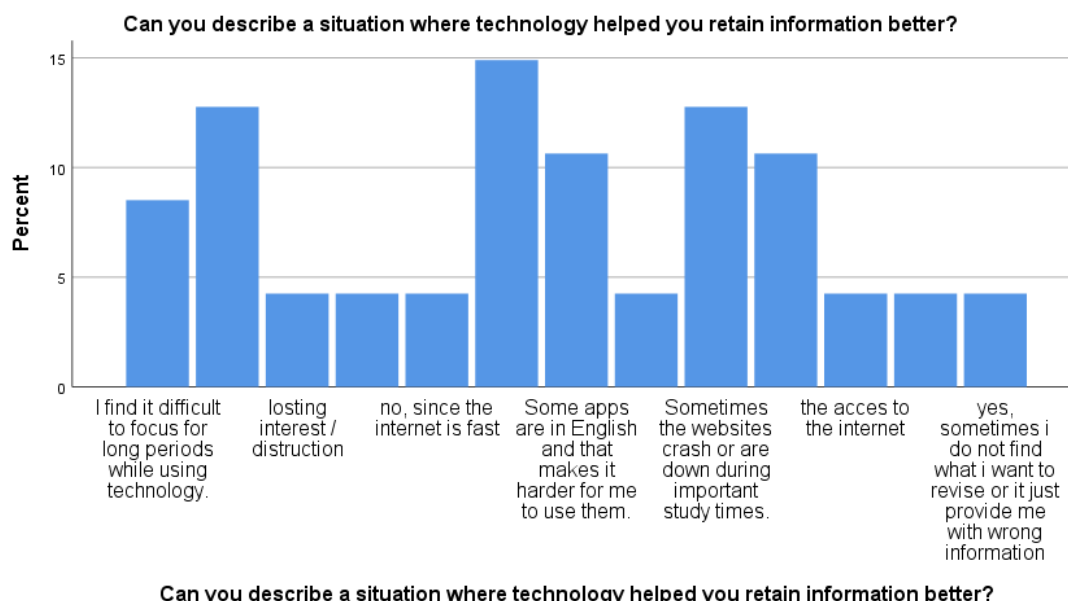


### Analysis:

Students use a variety of technology-based methods to improve their learning and memory retention. Many find digital notes helpful because they are easy to access and use. Some students review downloaded notes daily on tablets or join online study groups to discuss exam questions. Recorded lectures, flashcard apps, and online practice tests are also popular tools. Watching explanatory videos related to exam topics is effective for many students, providing clear and simple explanations. Others appreciate digital mind maps and color-highlighted notes that make it easier to remember information. Overall, these methods show how technology supports different learning preferences.

9/- Can you describe a situation where technology helped you retain information better?

|                                                                                                                            | Frequency | Percent      |
|----------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| I find it difficult to focus for long periods while using technology.                                                      | 4         | 8,5          |
| I get distracted by social media when I study on my phone.                                                                 | 6         | 12,8         |
| lusting interest / destruction                                                                                             | 2         | 4,3          |
| no, I have a positive experience with technology                                                                           | 2         | 4,3          |
| no, since the internet is fast                                                                                             | 2         | 4,3          |
| Not all learning materials are free, which limits my access.                                                               | 7         | 14,9         |
| Some apps are in English and that makes it harder for me to use them.                                                      | 5         | 10,6         |
| sometimes it is hard for me to access to the internet, also when inaccessible web sites like moodle to revise              | 2         | 4,3          |
| Sometimes the websites crash or are down during important study times.                                                     | 6         | 12,8         |
| Sometimes, my internet connection is slow, so videos stop buffering.                                                       | 5         | 10,6         |
| the access to the internet                                                                                                 | 2         | 4,3          |
| yes, books on the internet sometimes are not for free and some web sites needed the university email which I couldn't find | 2         | 4,3          |
| yes, sometimes I do not find what I want to revise or it just provide me with wrong information                            | 2         | 4,3          |
| <b>Total</b>                                                                                                               | <b>47</b> | <b>100,0</b> |

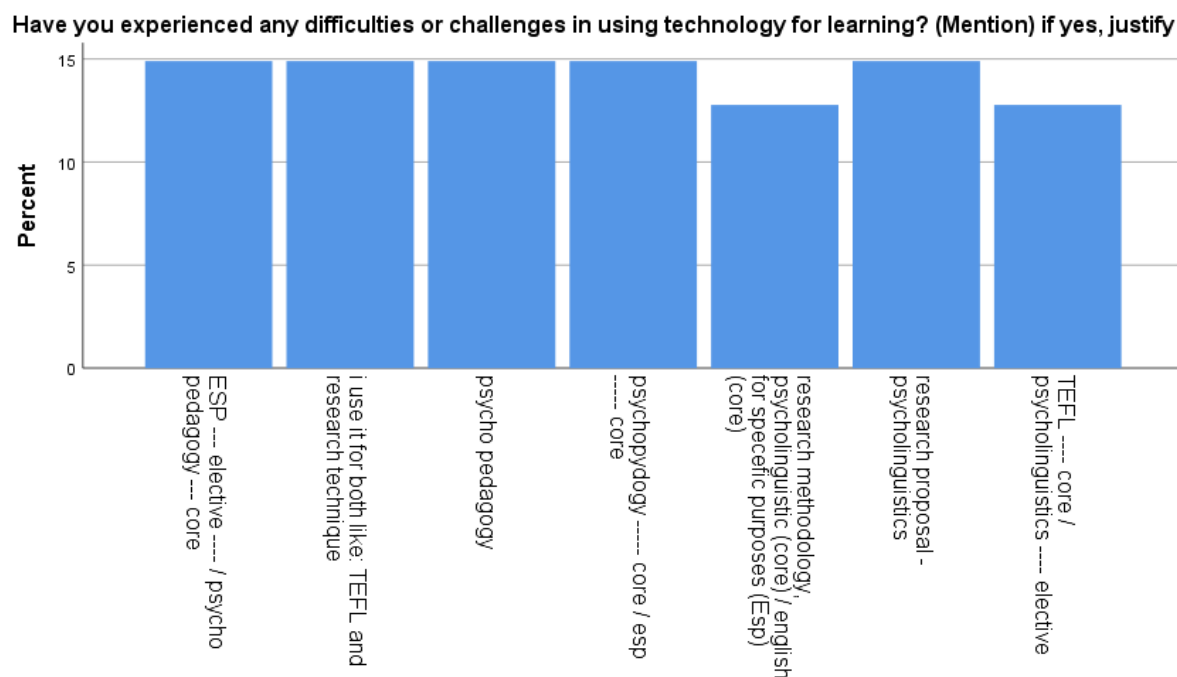


### Analysis:

When asked about challenges using technology to help retain information, some students reported difficulties with concentration and distractions, such as social media, affecting their study focus. Others mentioned technical problems like slow internet connections, website crashes, or limited access to certain learning materials that are behind pay walls or require university credentials. Language barriers with English-only apps also posed challenges for some participants. Despite these issues, a few students shared positive experiences with technology, appreciating its fast access to information. These mixed responses highlight that while technology can support learning, it also presents obstacles that students must navigate.

10/- Have you experienced any difficulties or challenges in using technology for learning?

|                                                                | Frequency | Percent |
|----------------------------------------------------------------|-----------|---------|
| <b>ESP --- elective ---- / psycho pedagogy --- core</b>        | 7         | 14,9    |
| <b>i use it for both like: TEFL and research technique</b>     | 7         | 14,9    |
| <b>psycho pedagogy</b>                                         | 7         | 14,9    |
| <b>Psycho pedagogy ----- core / esp. ----- core</b>            | 7         | 14,9    |
| <b>research methodology, psycholinguistic (core) / English</b> | 6         | 12,8    |
| <b>for specific purposes (Esp.) (core)</b>                     |           |         |
| <b>research proposal - psycholinguistics</b>                   | 7         | 14,9    |
| <b>TEFL ---- core / psycholinguistics ---- elective</b>        | 6         | 12,8    |
| <b>Total</b>                                                   | 47        | 100,0   |



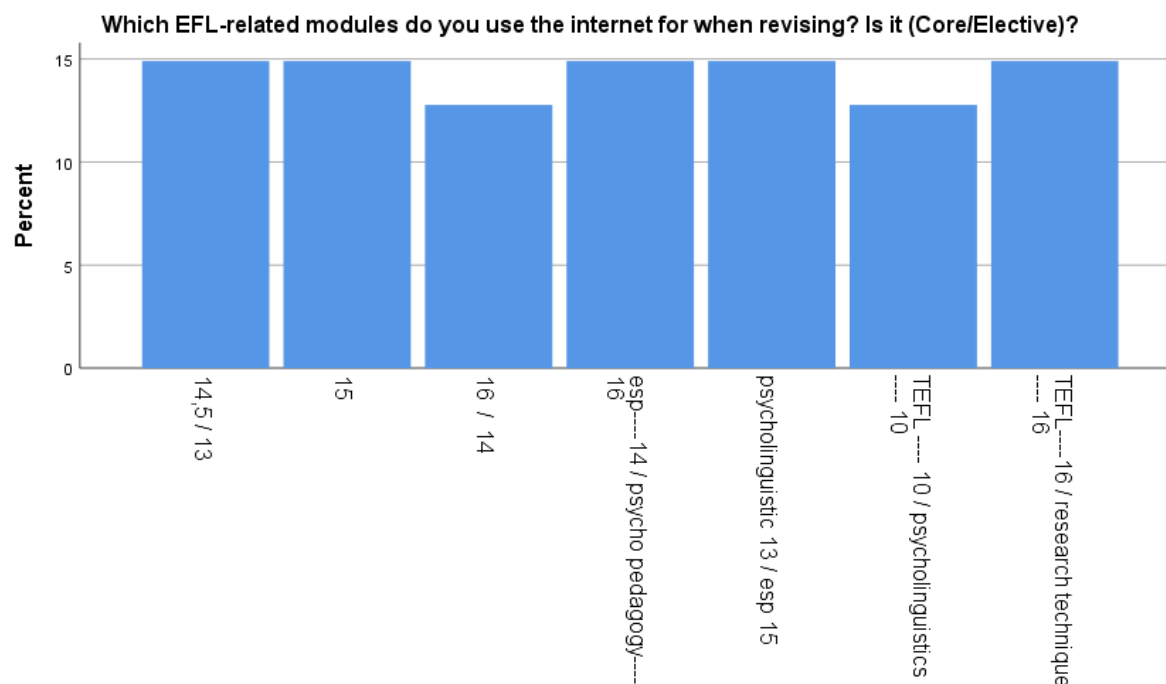
### Analysis:

The participants reported using technology mainly for several important modules in their studies. Many students use it for psycho pedagogy and ESP (English for Specific Purposes), both core and elective courses. Others mentioned using technology for TEFL, research methodology, psycholinguistics, and research proposal preparation. This shows that technology plays a key role in supporting learning across various subjects, especially those related to language teaching and research.

11/- Which EFL-related modules do you use the internet for when revising? Is it (Core/Elective)?

|                                          | Frequency | Percent |
|------------------------------------------|-----------|---------|
| 14,5 / 13                                | 7         | 14,9    |
| 15                                       | 7         | 14,9    |
| 16 / 14                                  | 6         | 12,8    |
| esp.----14 / psycho pedagogy----16       | 7         | 14,9    |
| psycholinguistic 13 / esp. 15            | 7         | 14,9    |
| TEFL ---- 10 / psycholinguistics ---- 10 | 6         | 12,8    |
| TEFL----16 / research technique ---- 16  | 7         | 14,9    |
| Total                                    | 47        | 100,0   |



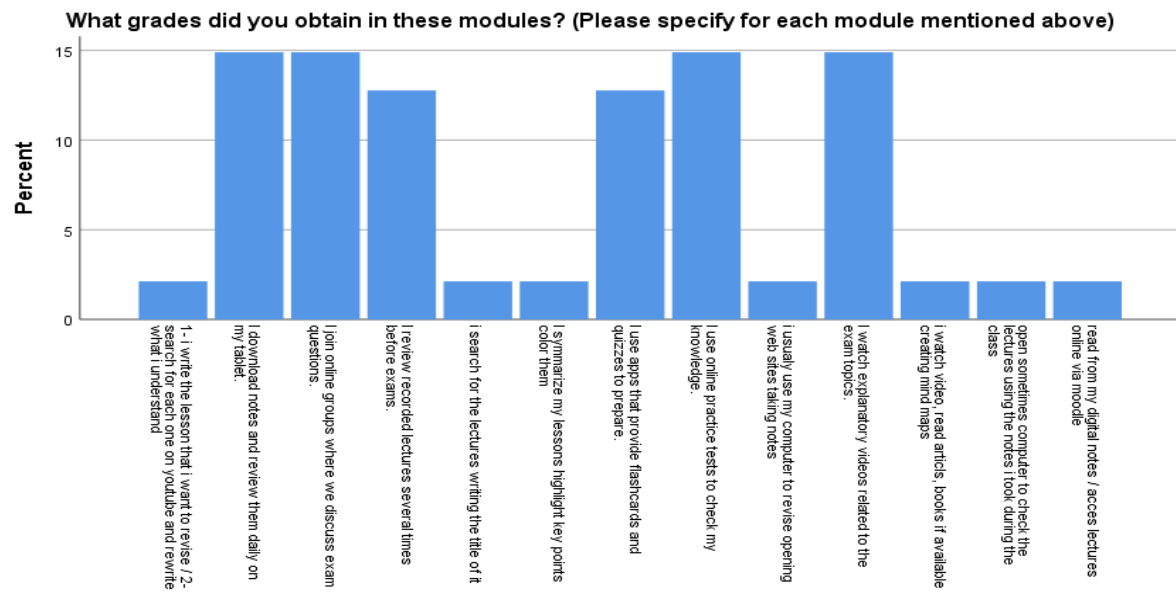


### Analysis:

The students use the internet to revise various EFL-related modules, both core and elective. Popular modules for internet use include Psycho Pedagogy, ESP (English for Specific Purposes), Psycholinguistics, TEFL, and Research Techniques. The frequency of internet use is quite balanced across these subjects, showing that students rely on online resources to support their study in different areas of their curriculum.

12/- What grades did you obtain in these modules? (Please specify for each module mentioned above)

|                                                                                                                 | Frequency | Percent |
|-----------------------------------------------------------------------------------------------------------------|-----------|---------|
| 1- I write the lesson that i want to revise / 2- i search for each one on YouTube and rewrite what i understand | 1         | 2,1     |
| I download notes and review them daily on my tablet.                                                            | 7         | 14,9    |
| I join online groups where we discuss exam questions.                                                           | 7         | 14,9    |
| I review recorded lectures several times before exams.                                                          | 6         | 12,8    |
| I search for the lectures writing the title of it                                                               | 1         | 2,1     |
| I summarize my lessons highlight key points color them                                                          | 1         | 2,1     |
| I use apps that provide flashcards and quizzes to prepare.                                                      | 6         | 12,8    |
| I use online practice tests to check my knowledge.                                                              | 7         | 14,9    |
| I usually use my computer to revise opening web sites taking notes                                              | 1         | 2,1     |
| I watch explanatory videos related to the exam topics.                                                          | 7         | 14,9    |
| i watch video, read articles, books if available creating mind maps                                             | 1         | 2,1     |
| open sometimes computer to check the lectures using the notes i took during the class                           | 1         | 2,1     |
| read from my digital notes / access lectures online via moodle                                                  | 1         | 2,1     |
| Total                                                                                                           | 47        | 100,0   |

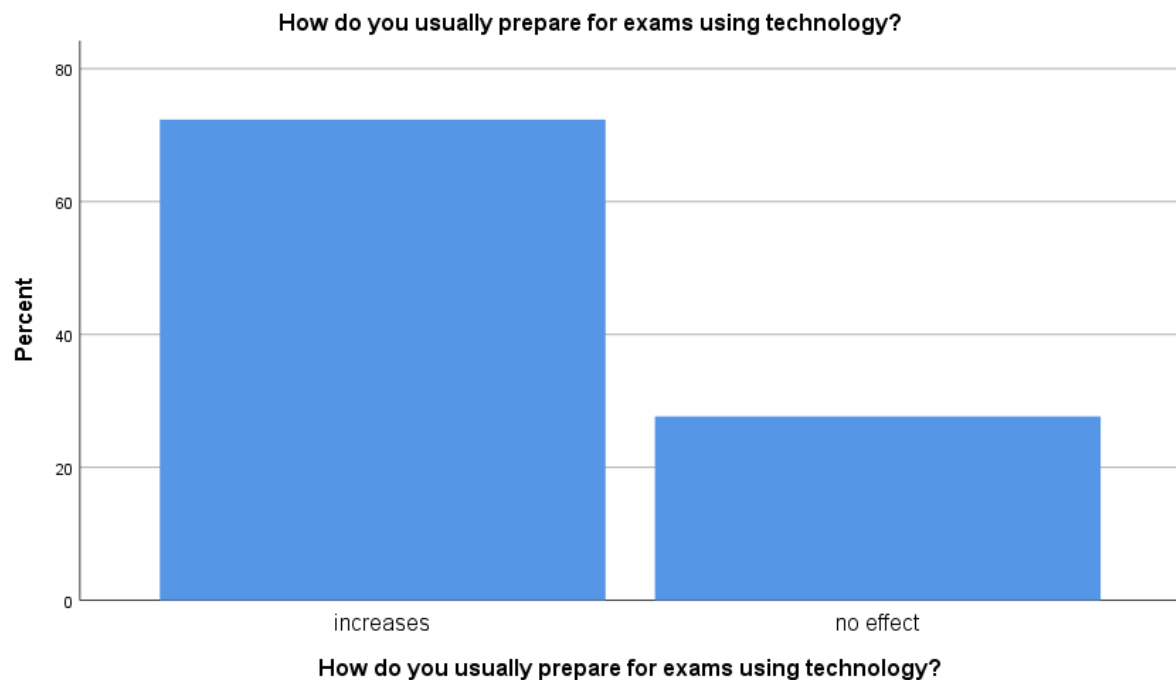


### Analysis:

The students use various methods to prepare for their exams and improve their grades. Many download notes and review them regularly, join online groups to discuss exam questions, and watch recorded lectures multiple times. Others use apps with flashcards and quizzes, online practice tests, and explanatory videos. Some also take notes on their computers and create mind maps. These diverse study strategies show that students combine different digital tools to better understand and remember their lessons.

13/- How do you usually prepare for exams using technology?

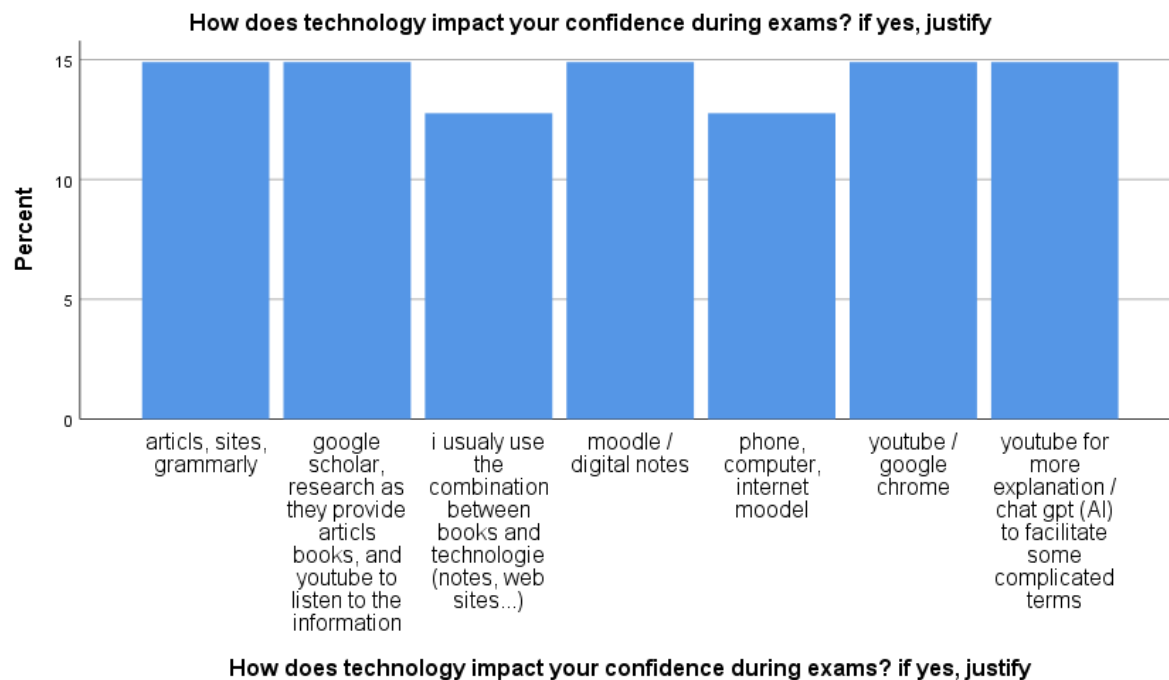
|                  | Frequency | Percent |
|------------------|-----------|---------|
| <b>increases</b> | 34        | 72,3    |
| <b>no effect</b> | 13        | 27,7    |
| <b>Total</b>     | 47        | 100,0   |



### Analysis:

Most students, about 72%, feel that using technology increases their confidence when preparing for exams. However, around 28% say technology has no effect on their confidence. This shows that for many students, technology plays an important role in boosting their exam preparation and self-assurance

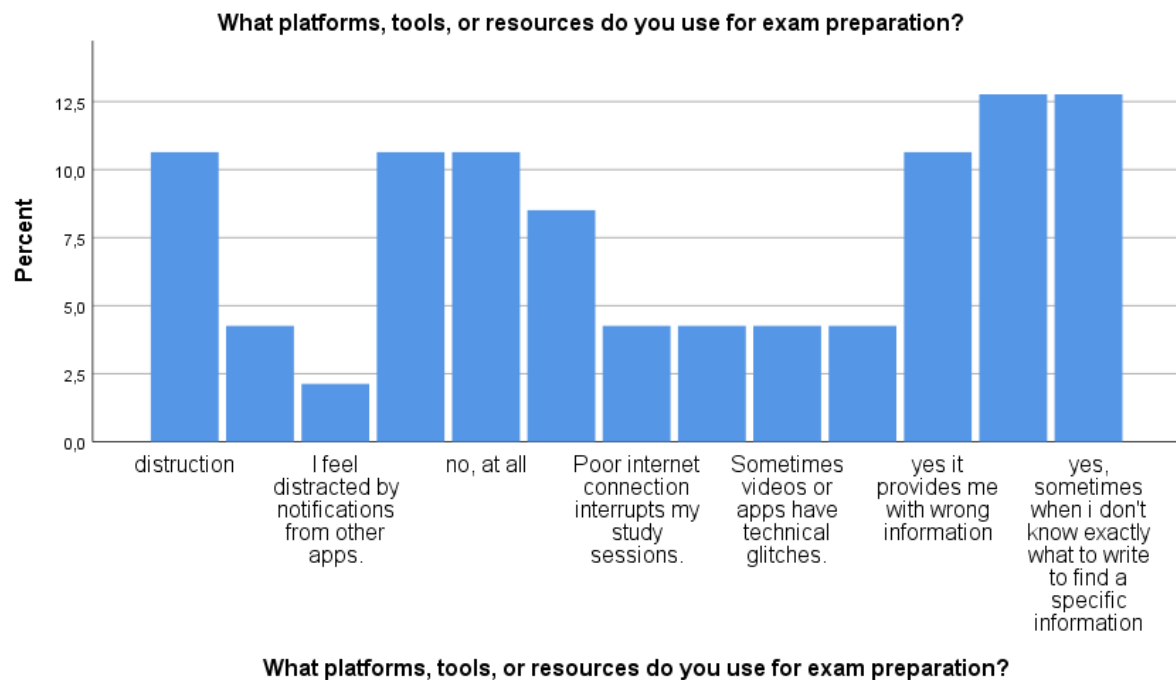
| 14/- How does technology impact your confidence during exams? if yes, justify                     |           |              |
|---------------------------------------------------------------------------------------------------|-----------|--------------|
|                                                                                                   | Frequency | Percent      |
| articles, sites, grammar                                                                          | 7         | 14,9         |
| Google scholar, research as they provide articles books, and YouTube to listen to the information | 7         | 14,9         |
| I usually use the combination between books and technology (notes, web sites...)                  | 6         | 12,8         |
| moodle / digital notes                                                                            | 7         | 14,9         |
| phone, computer, internet moodle                                                                  | 6         | 12,8         |
| YouTube / Google chrome                                                                           | 7         | 14,9         |
| YouTube for more explanation / chat gpt (AI) to facilitate some complicated terms                 | 7         | 14,9         |
| <b>Total</b>                                                                                      | <b>47</b> | <b>100,0</b> |



### Analysis:

Students use a variety of digital resources to prepare for exams and feel more confident. Many rely on articles, websites, and grammar tools, as well as Google Scholar and YouTube for explanations and research materials. Some combine traditional books with digital notes and websites. Moodle, phones, and computers are commonly used platforms. Additionally, students mentioned using AI tools like ChatGPT to help understand difficult terms. This variety shows how technology supports their learning and confidence in different ways.

| 15/- What platforms, tools, or resources do you use for exam preparation?                      |           |         |
|------------------------------------------------------------------------------------------------|-----------|---------|
|                                                                                                | Frequency | Percent |
| destruction                                                                                    | 5         | 10,6    |
| I don't always find content related to my exact subject.                                       | 2         | 4,3     |
| I feel distracted by notifications from other apps.                                            | 1         | 2,1     |
| no                                                                                             | 5         | 10,6    |
| no, at all                                                                                     | 5         | 10,6    |
| not at all                                                                                     | 4         | 8,5     |
| Poor internet connection interrupts my study sessions.                                         | 2         | 4,3     |
| Some resources are not trustworthy or accurate.                                                | 2         | 4,3     |
| Sometimes videos or apps have technical glitches.                                              | 2         | 4,3     |
| The devices I have are sometimes too slow or old.                                              | 2         | 4,3     |
| yes it provides me with wrong information                                                      | 5         | 10,6    |
| yes, as i have mentioned before the information not for free<br>or needed the university email | 6         | 12,8    |
| yes, sometimes when i don't know exactly what to write to<br>find a specific information       | 6         | 12,8    |
| Total                                                                                          | 47        | 100,0   |



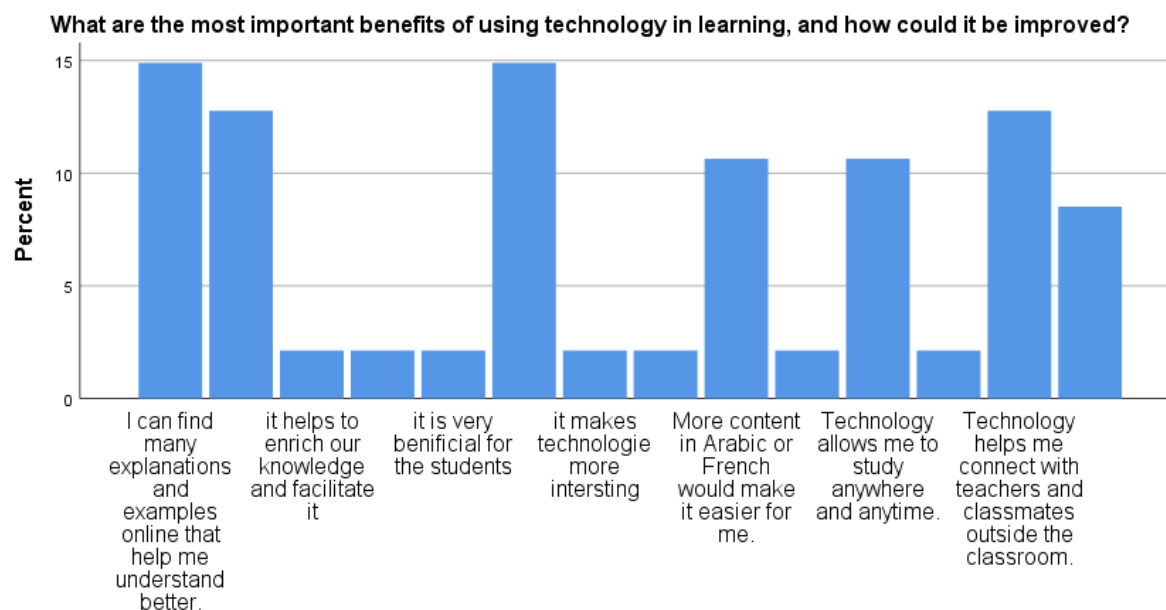
### Analysis:

Students face several challenges when using technology for exam preparation. Many reported distractions, such as notifications from other apps, and difficulties finding content specific to their subjects. Poor internet connections slow or outdated devices and technical glitches with videos or apps also affect their study sessions. Some students mentioned that certain resources are not free or require university access, and others worry about the accuracy of the information they find. These issues show that while technology is helpful, it also presents obstacles that students must manage.

16/- What are the most important benefits of using technology in learning, and how could it be improved?

|                                                                                                              | Frequency | Percent |
|--------------------------------------------------------------------------------------------------------------|-----------|---------|
| <b>I can find many explanations and examples online that help me understand better.</b>                      | 7         | 14,9    |
| <b>If the internet was faster and more reliable, it would be better.</b>                                     | 6         | 12,8    |
| <b>it helps to enrich our knowledge and facilitate it</b>                                                    | 1         | 2,1     |
| <b>it improve our thinking and provide us with more ideas</b>                                                | 1         | 2,1     |
| <b>it is very beneficial for the students</b>                                                                | 1         | 2,1     |
| <b>It makes learning more interactive and less boring.</b>                                                   | 7         | 14,9    |
| <b>it makes technology more interesting</b>                                                                  | 1         | 2,1     |
| <b>it simplify the learning process. It can be improved by spreading its to all students from all levels</b> | 1         | 2,1     |
| <b>More content in Arabic or French would make it easier for me.</b>                                         | 5         | 10,6    |
| <b>more information, help retain then, easy to access less at rest</b>                                       | 1         | 2,1     |
| <b>Technology allows me to study anywhere and anytime.</b>                                                   | 5         | 10,6    |
| <b>technology facilitate the process of learning giving various simple ideas</b>                             | 1         | 2,1     |
| <b>Technology helps me connect with teachers and classmates outside the classroom.</b>                       | 6         | 12,8    |
| <b>Training on how to use educational apps effectively would help a lot.</b>                                 | 4         | 8,5     |
| <b>Total</b>                                                                                                 | 47        | 100,0   |





What are the most important benefits of using technology in learning, and how could it be improved?

### Analysis:

Students find many benefits in using technology for learning. They appreciate the availability of explanations and examples online, which help them understand better. Technology makes learning more interactive and less boring, and it allows students to study anytime and anywhere. Many also value how it helps them connect with teachers and classmates outside the classroom. However, students suggest improvements such as faster and more reliable internet, more content available in Arabic or French, and training on how to use educational apps effectively. These changes could make technology even more helpful for learning.

### Results:

- ❖ The majority of participants in the study are students specializing in Civilization, with a smaller number studying Didactics or both fields. This reflects the sample's focus and helps contextualize their study habits and technology use.
- ❖ Most students prefer a combination of traditional and technology-based study methods, showing their flexibility in integrating different approaches to learning for better results.
- ❖ Regarding study methods, a significant portion of students favors traditional techniques, while a smaller group relies on purely technology-based approaches. The mixed method remains the most popular, indicating a balanced use of resources.

- ❖ Students typically use technology between 5 to 10 hours per week for studying, though some spend less and others more, reflecting individual differences in digital engagement.
- ❖ Smartphone's and computers are the most commonly used devices for studying, followed by tablets and internet platforms, which shows reliance on portable and accessible technology.
- ❖ Most participants believe that technology improves their ability to retain information, though a notable minority feel it has no effect, indicating varied individual experiences with digital learning tools.
- ❖ Digital notes and videos are the most effective technology-based methods for learning and memory retention, with books and apps also contributing significantly to students' study processes.
- ❖ Students highlighted specific technology-based techniques that help them retain information better, such as using color highlights, digital flashcards, mind maps, recorded lectures, and online quizzes.
- ❖ Despite the benefits, students face challenges like distractions from social media, limited free resources, language barriers, and technical issues like slow internet or inaccessible websites, which affect their learning experience.
- ❖ The internet is used mainly for revising core and elective modules related to English as a Foreign Language (EFL), such as Psycho Pedagogy, ESP, Psycholinguistics, and TEFL, showing how digital resources support diverse subject areas.
- ❖ Students employ various methods to prepare for exams, including downloading notes, participating in online groups, reviewing recorded lectures, using flashcards and quizzes, and watching explanatory videos, demonstrating a comprehensive use of technology for learning.
- ❖ A large majority of students feel that technology increases their confidence when preparing for exams, highlighting its positive impact on their motivation and readiness.
- ❖ Digital tools like articles, Google Scholar, YouTube, Moodle, and AI (such as ChatGPT) are widely used to facilitate exam preparation, illustrating the diverse range of resources students rely on.
- ❖ Students also face difficulties such as distractions, technical problems, unreliable information, and limited access to paid resources or university platforms, which can hinder effective study.
- ❖ Problems like poor internet connection, outdated devices, and technical glitches occasionally disrupt students' learning, emphasizing the need for better infrastructure and support.

❖ Overall, students appreciate the many benefits of technology in learning, including accessibility, interactivity, and connectivity with peers and teachers. They suggest improvements like faster internet, more content in their native languages, and training on educational apps to maximize technology's effectiveness.

### **Conclusion:**

This study highlights the significant role that technology plays in enhancing learning and memory retention among EFL learners. By using a structured questionnaire distributed to a sample of 47 students, we were able to collect valuable data regarding their habits, preferences, and challenges related to technology-assisted learning. The use of **SPSS V25** for data analysis added scientific credibility to the results, allowing for accurate interpretation of frequency distributions and percentages.

Through SPSS, the study revealed clear patterns: a majority of student's find digital tools helpful for studying, prefer a mix of traditional and technological methods, and use devices like smart phones and computers regularly for academic purposes. Moreover, the analysis showed that tools such as videos, digital notes, and online quizzes contribute positively to information retention and exam preparation.

Importantly, SPSS helped us detect not only the benefits but also the challenges students' face such as distractions, poor internet access, and limited free resources which would not have been as clearly understood without statistical support. This underlines the need for educational institutions to invest in digital infrastructure and provide training on the effective use of educational technologies.

In conclusion, this study confirms that when effectively integrated and supported, technology can be a powerful ally in language learning. The use of SPSS in analyzing the data has reinforced the validity of the findings and offers a reliable foundation for future research and pedagogical strategies.

# General Conclusion

### General Conclusion

This dissertation aimed to explore the effects of modern technology including mobile phones, computers, and the internet on the memory retention and academic performance of EFL learners at Saida University Department of English. The focus was particularly on Master 1 English students in the fields of didactics and civilization. By investigating how technology is integrated into language learning and how it compares with traditional teaching methods, the study hoped to identify both the benefits and challenges associated with digital learning tools in the Algerian university context. The first chapter provided the theoretical framework necessary to understand the relationship between technology and memory. It defined the core concepts of short-term memory, working memory, and long-term memory, while also discussing how each of these is activated during second language acquisition.

Furthermore, it examined different factors that may influence memory retention in EFL settings, such as repetition, motivation, distractions, and teacher guidance. The chapter also gave a general-to-specific historical background on the rise of technology globally, in Algeria, and particularly during the COVID-19 pandemic at Saida University in the Department of English. The second chapter described the methodology used in this research. A mixed-methods approach was applied, combining quantitative data (through student questionnaires) and qualitative data (through teacher interviews and classroom observations). These tools were chosen to give a more comprehensive understanding of the topic.

The data collection targeted both the perspectives of learners and the experiences, which added depth and reliability to the research. In the third chapter, the collected data were analyzed and interpreted. The findings revealed that while many students benefit from using technology to support their learning and improve memory retention, there are also some drawbacks, such as easy distractions and the risk of becoming overly dependent on digital devices. Teachers shared their views on how technology should be used more thoughtfully and in a pedagogically sound manner, with attention to learners' cognitive capacities and classroom objectives.

To conclude, this study has shown that educational technology can enhance EFL learning when used appropriately, especially in terms of memory support and exam preparation. However, it also highlighted the importance of teacher supervision, content selection, and balanced usage. However, the study faced some limitations, such as time constraints limited deeper data collection and analysis. Its findings may still be useful for educators, researchers, and policy-makers who are interested in improving language learning outcomes through the smart use of technology.

## **Limitation and Recommendation:**

---

### **❖ Limitation and Recommendation**

#### **➤ Limitations of the Study**

This study faced several limitations:

1. Time constraints limited deeper data collection and analysis.
2. Some students did not take the questionnaire seriously, choosing random answers.
3. Data collection was delayed due to student absences, especially early in the semester.
4. Limited sample size (47 students and 5 teachers) may not fully represent the larger population.
5. Observations were few and may not reflect all classroom practices.

#### **➤ Recommendations**

Based on the findings, the following recommendations are made:

1. Combine technology and traditional methods to support memory and focus.
2. Provide training for teachers on effective use of digital tools.
3. Encourage responsible technology use among students.
4. Explain the importance of questionnaires to improve answer quality.
5. Plan data collection earlier and during high attendance periods.
6. Improve classroom tech facilities to ensure smooth use of devices.
7. Use technology for group work to boost interaction and retention.
8. Conduct further research to explore long-term effects of tech in EFL learning.

# References

## References:

---

### References (in APA Style)

- Adams, D. (2004). *Computer-Based Learning: A Guide to Effective Implementation*. Educational Technology Publications.
- Ally, M. (2004). Foundations of educational theory for online learning. In T. Anderson (Ed.), *Theory and practice of online learning* (pp. 3–31). Athabasca University Press.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation* (Vol. 2, pp. 89–195). Academic Press.
- Baddeley, A. (1997). *Human memory: Theory and practice*. Psychology Press.
- Baddeley, A. D., & Hitch, G. (1974). Working memory. In G. H. Bower (Ed.), *The psychology of learning and motivation* (Vol. 8, pp. 47–89). Academic Press.
- Beatty, K. (2003). *Teaching and researching computer-assisted language learning*. Pearson Education.
- Blake, R. J. (2011). *Brave new digital classroom: Technology and foreign language learning*. Georgetown University Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2), 77–101.
- Brown, H. D. (2001). *Teaching by principles: An interactive approach to language pedagogy* (2nd ed.). Longman.
- Butler-Pascoe, M. E. (1997). Technology and second language learners. *American Language Review*, 1(3), 20–22.
- Cepeda, N. J., Pashler, H., Vul, E., Wixted, J. T., & Rohrer, D. (2006). Distributed practice in verbal recall tasks: A review and quantitative synthesis. *Psychological Bulletin*, 132 (3), 354–380.
- Cowan, N. (2008). What are the differences between long-term, short-term, and working memory? *Progress in Brain Research*, 169, 323–338.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.
- Darling-Hammond, L., & Bransford, J. (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. Jossey-Bass.



## References:

---

- Dörnyei, Z. (2001). *Motivational strategies in the language classroom*. Cambridge University Press.
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.
- Ellis, R. (2002). *The study of second language acquisition*. Oxford University Press.
- Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language. *Studies in Second Language Acquisition*, 27(2), 141–172.
- Fraenkel, J. R., & Wallen, N. E. (2009). *How to design and evaluate research in education* (7th ed.). McGraw-Hill.
- Freeman, D. (2000). *Techniques and principles in language teaching* (2nd ed.). Oxford University Press.
- Gilakjani, A. P. (2017). A review of the literature on the integration of technology into the learning and teaching of English language skills. *International Journal of English Linguistics*, 7(5), 95–106.
- Godwin-Jones, R. (2018). Using mobile technology to develop language skills and cultural understanding. *Language Learning & Technology*, 22(3), 104–120.
- Harmer, J. (2007). *The practice of English language teaching* (4th ed.). Longman.
- Hollands, F. M., & Escueta, M. (2020). The use of technology in education. In M. Spector, D. Ifenthaler, D. Sampson, & P. Isaias (Eds.), *Competencies in Teaching, Learning and Educational Leadership in the Digital Age* (pp. 1–19). Springer.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14–26.
- Just, M. A., & Carpenter, P. A. (1992). A capacity theory of comprehension: Individual differences in working memory. *Psychological Review*, 99(1), 122–149.
- Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon.
- Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. SAGE.
- Lam, Y., Lam, P., Lam, S., & McNaught, C. (2009). Usability and usefulness of e-learning. *British Journal of Educational Technology*, 40(3), 471–485.
- Mayer, R. E. (2005). *The Cambridge handbook of multimedia learning*. Cambridge University Press.
- McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence-based inquiry* (7th ed.). Pearson.
- Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63(2), 81–97.

## References:

---

- Miyake, A., & Friedman, N. P. (1998). Individual differences in second language proficiency: Working memory as language aptitude. In A. F. Healy & L. E. Bourne Jr. (Eds.), *Foreign language learning: Psycholinguistic studies on training and retention* (pp. 339–364). Lawrence Erlbaum.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge University Press.
- Nation, I. S. P. (2013). *Learning vocabulary in another language* (2nd ed.). Cambridge University Press.
- Neisser, U. (1967). *Cognitive psychology*. Appleton-Century-Crofts.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.
- Pallant, J. (2016). *SPSS survival manual* (6th ed.). Open University Press.
- Reinders, H., & Benson, P. (2017). Research agenda: Language learning beyond the classroom. *Language Teaching*, 50(4), 561–578.
- Reinders, H., & White, C. (2011). Special issue: The theory and practice of autonomy in language learning with technology. *Computer Assisted Language Learning*, 24(1), 1–3.
- Richards, J. C., & Rodgers, T. S. (1986). *Approaches and methods in language teaching: A description and analysis*. Cambridge University Press.
- Richards, J. C., & Rodgers, T. S. (2014). *Approaches and methods in language teaching* (3rd ed.). Cambridge University Press.
- Schacter, D. L. (2001). *The seven sins of memory: How the mind forgets and remembers*. Houghton Mifflin Harcourt.
- Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics*, 11(2), 129–158.
- Serin, H. (2011). The effects of the computer-based instruction on the achievement and problem solving skills of the science and technology students. *The Turkish Online Journal of Educational Technology*, 10(1), 183–201.
- Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, 53, 1–25.
- Ullman, M. T. (2001). A neurocognitive perspective on language: The declarative/procedural model. *Nature Reviews Neuroscience*, 2(10), 717–726.
- Ur, P. (1996). *A course in language teaching: Practice and theory*. Cambridge University Press.

## References:

---

- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Warschauer, M. (1996). Motivational aspects of using computers for writing and communication. In M. Warschauer (Ed.), *Telecollaboration in Foreign Language Learning*. University of Hawai'i Second Language Teaching and Curriculum Center.
- Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. MIT Press.
- Wen, Z. (2016). Working memory and second language learning. *Multilingual Matters*.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.

## Appendix:

---

### Appendix – Research Instruments

#### Appendix A: Student Questionnaire

This questionnaire was distributed to Master 1 students in the Department of English, specializing in Didactics and Civilization, to collect data on the impact of technology on memory retention and exam performance. Responses were confidential and used strictly for academic purposes.

##### Section 1: General Study Habits

1. 1. What is your field of study? (A) Civilization (B) Didactics
2. 2. What is your preferred study method? (A) Technology-based (B) Traditional (C) Combination
3. 3. How many hours per week do you use technology for studying? (A) <5 (B) 5–10 (C) >10
4. 4. Which devices do you use most often for studying? (A) Smartphone (B) Computer (C) Tablet (D) Internet (E) Other: \_\_\_\_\_

##### Section 2: Technology and Memory Retention

5. 5. What tools or methods do you use with technology to help you remember study material?
6. 6. How does technology influence your ability to retain information? (A) Improves (B) No Effect (C) Reduces
7. 7. Which technology-based methods do you find effective for learning and memory retention? (A) Videos (B) Digital Notes (C) E-books (D) Apps (E) Other: \_\_\_\_\_
8. 8. Can you describe a situation where technology helped you retain information better?
9. 9. Have you experienced any difficulties or challenges in using technology for learning? (If yes, justify)

##### Section 3: Technology and Exam Success

10. 10. Which EFL-related modules do you use the internet for when revising? Are they core or elective?
11. 11. What grades did you obtain in these modules? (Please specify for each module mentioned above.)
12. 12. How do you usually prepare for exams using technology?

## Appendix:

---

13. 13. How does technology impact your confidence during exams? (A) Increases (B) No Effect (C) Decreases (If yes, justify)
14. 14. What platforms, tools, or resources do you use for exam preparation? (Justify)
15. 15. Have you encountered any challenges when using technology for exam preparation? If so, what were they?

### Section 4: Opinions and Suggestions

16. 16. What are the most important benefits of using technology in learning, and how could it be improved?

### Appendix B: Teacher Interview Questions

The following semi-structured interview was used with the teachers Of English at Dr.Molay Tahar University to explore their experiences and perceptions of how technology impacts students' memory and academic performance.

17. 1. How long have you been teaching English as a Foreign Language?
18. 2. What is your module? Is it fundamental or elective?
19. 3. Have you always used technology in your teaching, or did you start using it recently?
20. 4. What specific types of technology do you use for teaching English (smartphones, computers, mobile apps)?
21. 5. Do you use technology differently for teaching different language skills (listening, speaking, reading, writing)? If yes, how?
22. 6. How do you ensure that technology supports learning rather than distracting students?
23. 7. What is the most important outcome students should obtain from your class? (Engagement, comprehension, retention, autonomy)
24. 8. Based on your experience, does using technology help students remember vocabulary and grammar better? Why or why not?
25. 9. Have you noticed any differences in students' memory retention when they use technology compared to traditional methods (books, handwriting, classroom lectures)?
26. 10. Do you encourage students to take digital notes or use traditional note-taking methods? Which is more effective for memory retention?
27. 11. Have you observed any improvement in students' exam results when they use technology for studying? Can you share examples?
28. 12. Does technology make students more independent learners, or do they rely too much on it?
29. 13. Do you think technology-based learning (e.g., videos, apps) improves critical thinking skills or leads to passive learning?
30. 14. Do students who rely on technology perform better in certain types of assessments (e.g., multiple-choice vs. written essays)?
31. 15. What are the biggest challenges you face when integrating technology into your teaching?
32. 16. Do you think students become too dependent on digital tools, affecting their ability to learn traditionally?
33. 17. How can teachers effectively balance the use of technology and traditional teaching methods? What recommendations would you give?

## الملخص:

تتناول هذه المذكرة تأثير التكنولوجيا، وتحديدًا الهواتف المحمولة، وأجهزة الحاسوب، والإنترنت، على الاحتفاظ بالمعلومات والأداء في الامتحانات لدى متعلمي اللغة الإنجليزية كلغة أجنبية (EFL) في قسم اللغة الإنجليزية بجامعة سعيدة. وقد دُفعت هذه الدراسة إلى الواجهة نتيجة التزايد المستمر في دمج الأدوات الرقمية في التعليم، لاسيما بعد جائحة كوفيد-19. تم اعتماد منهجية البحث المختلط التي جمعت بين الأسلوبين الكمي والنوعي للحصول على رؤية شاملة. تم جمع البيانات من خلال ثلاثة أدوات: استبيان شارك فيه 47 طالبًا من طلبة الماستر السنة الأولى تخصصي "تعليمية اللغة الانجليزية" و"حضارة"، ومقابلات شبه مهيكلة مع خمسة أساتذة، بالإضافة إلى ملاحظات صفية داخل الفصول الدراسية. وفرت البيانات الكمية رؤى إحصائية حول استخدام الطلاب للتكنولوجيا وتأثيرها المتصور، بينما أظهرت البيانات النوعية وجهات نظر أعمق من خلال تجارب الأساتذة وسلوك الطلبة داخل القسم. كشفت النتائج أنّ التكنولوجيا تلعب دورًا مزدوجًا في تعلم اللغة الإنجليزية كلغة أجنبية؛ فمن جهة، تسهم في تسهيل الوصول إلى الموارد، وتعزيز الدافعية، ودعم الذاكرة من خلال الوسائط البصرية والسمعية. ومن جهة أخرى، قد تؤدي إلى التشتت وتقليل التفاعل الوجيه وتشجيع التعلم السطحي في حال غياب التوجيه المناسب. كما أظهرت الدراسة تباينًا في كيفية تفاعل الطلبة مع التكنولوجيا ومدى جديتهم في الإجابة عن أسئلة الاستبيان. خلصت الدراسة إلى أن التكنولوجيا تمتلك القدرة على دعم الاحتفاظ بالمعلومات والنجاح الأكاديمي، إلا أن فعاليتها تعتمد بدرجة كبيرة على طريقة إدماجها في بيئة التعلم. اختُتمت المذكرة بتوصيات عملية موجهة للأساتذة والطلبة والمؤسسات من أجل تشجيع الاستخدام الهادف للأدوات الرقمية في تعليم اللغة الإنجليزية كلغة أجنبية .

❖ **الكلمات المفتاحية:** التكنولوجيا، الاحتفاظ بالمعلومات، متعلمو اللغة الإنجليزية كلغة أجنبية، الأداء في الامتحانات.

## **Resumé:**

---

### **Résumé :**

Ce mémoire étudie l'impact de la technologie notamment les téléphones portables, les ordinateurs et Internet sur la rétention de la mémoire et la performance aux examens chez les étudiants d'Anglais comme langue étrangère (EFL) à l'Université de Saïda Dr. Moulay Tahar. Face à l'intégration croissante des outils numériques dans l'enseignement, en particulier après la pandémie de COVID-19, une approche mixte a été adoptée, combinant questionnaires (47 étudiants), entretiens (5 enseignants) et observations en classe. Les résultats ont montrés que la technologie peut améliorer la motivation, l'accès aux ressources et la mémorisation grâce aux supports visuels et auditifs. Cependant, elle peut aussi provoquer des distractions et limiter l'interaction directe si elle est mal utilisée. L'étude conclut que l'efficacité des outils numériques dépend fortement de leur intégration pédagogique. Des recommandations sont proposées pour optimiser leur usage dans l'enseignement de l'EFL.