PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
UNIVERSITY OF MOSTAGANEM
ABDELHAMID IBN BADIS
FACULTY OF FOREIGN LANGUAGES
DEPARTMENT OF ENGLISH

The Effect of Gamified Language on Learners' Memory in EFL Context

THESIS SUBMITTED IN CANDIDACY FOR THE DEGREE OF DOCTORATE ES-SCIENCES IN APPLIED LINGUISTICS AND NEW TECHNOLOGIES

Candidate: BOUDOUR Khadidja

BOARD OF EXAMINERS:

Dr. Benyoucef Radia	**Chairwoman**	**University of Mostaganem**
Dr. Moulai Hacene Yacine	**Supervisor**	**University of Tiaret**
Prof. Benabed Ammar	**Examiner**	**University of Tiaret**
Prof. Berrezoug Hanaa	**Examiner**	**University of Saida**
Dr. Hirech Faiza	**Examiner**	**University of Mostaganem**
Dr. Benamour Youcef	**Guest**	**University of Tiaret**

2023/2024

Dedication

This piece of word is heartedly dedicated to the dearest persons on earth, my parents, your unwavering support and boundless love have been the cornerstone of my journey. This work is a reflection of your sacrifices, belief, and the resilience you instilled in me. Thank you for being the pillars of strength upon which I built this achievement.

To my loving husband, your belief in me has been a guiding light, and I am profoundly grateful for the shared journey we continue to embark upon. This work is as much a testament to our partnership as it is to personal triumph.

Anir, my precious piece of me. Your presence has given me the courage to dream bigger and work harder. This achievement is dedicated to you, my greatest joy and motivation. May it serve as a reminder that dreams are worth pursuing. I am thankful for the joy and purpose you bring to my life.

To the candles that enlighten my life; my sisters and brothers and Ahmed; in each of you, I found allies, confidantes, and sources of inspiration.

To my nieces and nephews, you are the promise of the future, and your innocence and joy have been a constant source of motivation. As you grow, may this work serve as a reminder that with dedication and passion, one can turn dreams into reality.

This dedication is a humble token of my gratitude. Each of you played a unique role in shaping this journey, and I am blessed to have such an incredible support system.

Acknowledgments

With profound gratitude, I dedicate this work to my supervisor Dr. Yacine MOULAI HACENE, whose boundless patience, unwavering guidance, and genuine belief in my potential fuelled the flames of my perseverance. Your mentorship and expertise have been a beacon of light, transforming challenges into stepping stones to shape the trajectory of my research.

I wish to extend my gratitude to the board of examiners, namely Dr. Benyoucef Radia, Prof. Benabed Ammar, Prof. Berrezoug Hanaa, Dr. Hirech Faiza and Dr. Benamour Youcef, who accepted to devote time and effort to evaluate my work and bring forth valuable and constructive feedback to improve my research.

Further, I would also like to extend my appreciation to those who contributed, both near and far, to the success of this endeavour. Particularly to Dr. Youcef Benamour and the head of the DSPM lab, Prof. Hanane Sarnou, Prof. Zohra Labed, my tutors during the PhD cursus, my mentors during my very blossoming years at university: Prof. Lakhdar Barka and Prof. Chami Nidhal, my brother Dr. Boudour Ghalem as well as the librarian Safa (Mostafa) whose support and insights have enriched my work.

Likewise, I want to acknowledge the support I received from the directorate of education in Mostaganem, the inspector of English Mrs. Bakhta Amri and the school headmaster Mr. Touati Khoussa. Not to forget, my pupils in 2MS1 and 2MS2 classes who opened their hearts to me as a teacher, researcher and a friend.

Ultimately, this accomplishment is the result of a collective effort, and I am thankful for the contributions of each individual who played a part, directly or indirectly, in the realization of this work.

Abstract

The current thesis aims to illuminate the implementation of gamification and its impact on learners' capacity to acquire and retain vocabulary. It also explores the attitudes and perspectives of middle school teachers towards gamification in EFL classrooms. In order to gain a clearer insight into the phenomenon, the researcher has adopted both qualitative and quantitative research methods whereby the researcher seeks to explore gamification in the EFL classroom through action research methodology. Hence, the researcher adopted a semi-structured interview administered to 110 EFL teachers from various middle schools in Algeria, along with a post-test and a delayed post-test to measure learners' retention capacity of vocabulary. The participants consist of 70 second-year middle school learners in the city of Mostaganem. The collected data from the interviews were analyzed using a descriptive analysis approach, based on thematic analysis. Whereas the quantitative data from the tests was analyzed using the SPSS software to measure the retention rate of learners and investigate the impact of gamification on vocabulary learning and retention. The analysis was performed with reference to Bloom's taxonomy to interpret the collected data. After the analysis, the study provided a clear understanding of the teachers' standpoint regarding gamification, showing their openness and readiness to adopt modern teaching methods. The study also provides valuable insights into the integration of gamification for vocabulary learning and retention. It also paves the way for future interventions to explore the effects of gamified methods on other aspects of language learning.

Keywords: Gamification in education, vocabulary retention, Algerian EFL teachers, middle school learners, Kahoot!

List of Tables

List of Figures

Table of Contents

CHAPTER THREE: SCOPE & METHODOLOGY

CHAPTER FOUR: COMPREHENSIVE DATA ANALYSIS AND DISCUSSION

Appendices

1. Teachers' Interview

2. Post-test and Delayed Post-test

3. Authorisations from the Education Board

GENERAL INTRODUCTION

The teaching and learning process has become an art of its own. Each learner and teacher thoughtfully approach knowledge through his or her own perspective, creating and innovating strategies that are appealing and easy to grasp. This process of knowledge transmission is also a science with its own principles, methods, and techniques that are well-designed to be used as a roadmap to achieving learning. With all these science-based principles, a teacher cannot help but add their artistic touch to enhance their classes and meet their learners' thirst for knowledge.

Didacticians and pedagogues develop ways to facilitate learning and provide teachers with tools and techniques to design lessons and prepare the necessary materials for knowledge transfer, adapting them to the diverse learning styles of learners. When communication between educational experts and teachers in the field is efficient, the interaction between teachers and learners in the classroom setting becomes smooth, especially if the teacher tailors their teaching strategies to the learners' unique needs and styles. A teacher who is savvy enough with didactical and pedagogical methods, which cover an understanding of learners' individual needs, differences, preferences, and cognitive styles, can create teaching dynamics that foster participation and engagement, along with delivering comprehensible information to young learners.

These youngsters have always learned numbers and letters before school through gameplay. All genres of games, whether analogy, kinaesthetic, or digital, have created a learning environment that benefits both learners and teachers. Teachers often prefer using existing or adapted games to align with their learning objectives because playful learning is more engaging for learners compared to serious learning. As a result, game-based learning has emerged as a method for transferring knowledge in almost all subjects. Scholars and theorists

have made significant contributions to enable the effective use of traditional and technological games for learning purposes.

Complementary to this, the changes that occur at the level of educational approaches are a natural process. Innovations in the field of didactics and pedagogy are occurring rapidly and consistently, making it challenging for education stakeholders to keep up with the latest trends in education. All actors and participants responsible for the design of teaching and learning should give thoughtful consideration and make fruitful efforts to stay up-to-date and maximize the benefits of educational innovations. The incorporation of digital technology in education has been widely adopted in the recent decade, thanks to the benefits it offers in enhancing learning. Teachers no longer use CDs and electronic dictionaries; instead, they tend to opt for interactive simulations, digital and e-learning platforms to deliver educational content to learners of all styles and levels, anytime and anywhere. This increase in technology adoption creates a mode of active personalized learning with differentiated instruction that caters to each learner's individualized needs and aspirations.

Nonetheless, one cannot determine which type of technology has a more or less positive or negative effect on specific aspects of learning without conducting exhaustive research for that purpose. Research in the field of education, especially language learning, should address various gaps in digital educational technology and its effects on interaction, performance, engagement, etc. There are many genres of digital technology for education, and many of them are still undiscovered, creating discrepancies in educational research. According to the chatbot ChatGPT, the most recent adaptive educational technologies include Artificial Intelligence (AI), Virtual and Augmented Reality (VR & AR), neuro-education, and gamification. The latter is widely adopted in many arenas due to the positive outcomes it offers by strengthening and fostering positive behaviour. The human brain has been purposefully innovated gamification

even before the emergence of technology and the digital age. Peculiarly, some of our daily objects are gamified to encourage a certain attitude or behaviour. A simple example would be shoes designed with lightning or beeping sounds to encourage toddlers to walk!

Gamification fosters an atmosphere of enthusiasm, fun, and competition through the game elements integrated into serious learning contexts. It positively affects the quality of education, primarily at the level of learners' performance and engagement. Despite the fact that a considerable number of researchers has addressed this approach, it remains a relatively unexplored area of research, especially in Algeria. The educational policy in Algeria is not adventurous enough to officially adopt gamification as a guaranteed approach. It is the role of the teacher to explore the field and adapt it to the Algerian classroom for language teaching, with careful considerations.

When discussing language learning and teaching, it is essential to emphasize that vocabulary learning and acquisition are central to this process. It is a common goal shared by both learners and teachers. To effectively convey a message with the intended meaning, it is essential to use an appropriate selection of vocabulary to facilitate clear communication. Beginner language speakers need to acquire the essential vocabulary to convey an idea. This process is necessary and daunting at the same time. The efforts made by language learners and teachers often lead to unfulfilled pursuits in mastering a good amount of vocabulary, which sometimes push learners to abandon the learning of the whole language in despair. Henceforth, teachers seek methods such as gamification to make the process of vocabulary learning less stressful and more sustainable.

Research in the field of educational gamification has covered many important aspects of learning, focusing primarily on studying engagement, motivation, and performance.

Researchers and educational experts are making numerous attempts to explore the potential of gamification. However, the literature review lacks empirical research with well-grounded findings that comprehensively cover gamification in relation to language learning and vocabulary retention. Hopefully, this research addresses the gap in the existing literature enriching the research arena with concrete findings on gamification and vocabulary retention. The study is going to make a significant contribution to unveiling the potential effects of gamification on vocabulary retention and learners' capacity to memorize vocabulary. This particular theme has not been addressed in the Algerian context to the best of our knowledge. Eventually, it would be beneficial to the current literature to enlighten those interested in research about vocabulary learning and retention. Beyond that, educational experts will certainly find answers to their queries and future projects of syllabus design in teaching English as a Foreign Language (EFL).

In the present research, vocabulary learning and retention are studied at the level of one of the Algerian middle schools, specifically Koibich Ahmed Middle School in Mostaganem. The choice of the topic is motivated by the researcher's humble experience as a middle school English teacher. Gamifying English classes could, to some extent, enhance learners' engagement, interest, and focus in class, primarily through the use of rewarding points and competition. To elaborate, the present research attempts to draw attention to gamified language learning and its effect on learners' capacity to memorize vocabulary and engage them through the use of Kahoot!. The main research question of the present study is:

To what extent does gamification affect the language learning environment in terms of vocabulary retention?

In order to answer the aforementioned research question, a set of sub-research questions are taken into account and they are as follows:

- What is the impact of gamification on learners' ability to memorize vocabulary?

- What effect does gamification have on vocabulary learning?

- What benefits does Kahoot! offer?

- What are the attitudes of teachers towards gamification in general and specifically towards Kahoot!?

To address the research questions mentioned above, the following hypotheses are formulated for the investigation:

- Gamification contributes to some extent to optimizing vocabulary retention.
- Game mechanics can enhance learners' engagement and performance in the classroom.
- Kahoot, as a gamification tool, could facilitates learning in a digital environment.
- Both learners and teachers might have positive attitudes towards gamification.

Throughout the thesis, the researcher aims to offer a comprehensive understanding of gamification as an umbrella term encompassing various aspects of life, along with a detailed practical explanation of educational gamification, specifically as an approach for language learning. By doing so, the researcher delved deeply into the field and explored methods to enhance vocabulary acquisition and retention through gamification, which posed a challenging project to undertake. To schematize the thesis, there are four chapters that provide the reader with an understanding of gamification in language education and explain the findings of the research undertaken.

The first chapter is explanatory in nature, providing a conceptual, historical, and up-to-date overview of game-based learning and gamification. Having a good understanding of the fundamental concepts directly related to gamification enables the reader to become knowledgeable about this innovative approach, especially in education. Particularly this chapter starts by differentiating between gamification, games and game-based learning. Furthermore, it discusses the historical and theoretical background of gamification along with its mechanism, requirements and significance in teaching and learning.

The second chapter delves into a more specific objective by connecting gamification to language and vocabulary acquisition. It incorporates strategies for learning and retaining new lexis through assisted language learning techniques, as well as an explanation of the process and difficulties of vocabulary learning. Furthermore, Bloom's Taxonomy is used as a reference for language learning, especially vocabulary acquisition, in relation to gamification, as both concepts are the focal points of our study.

The third and fourth chapters deal with practical issues, whereby the research employs a combination of qualitative and quantitative methods within an action research framework. It also attempts to find a way to optimize learning and teaching in an ICT based environment. In order to obtain the desired data, the research has gone through two phases. First, she conducted an exploratory research by interviewing teachers to investigate their perspectives on gamification. This is done to pave the way for the actual implementation of the gamification method within the classroom context. Afterwards, following a quasi-experimental method performed with experimental and control groups, the researcher applied gamification in the classroom context using Kahoot! app. Subsequently, post-tests and delayed post-tests were administered to assess distinctions or resemblances between the groups. Ultimately, this study

aims to ascertain the impact of gamification on learners' vocabulary acquisition and retention abilities. The findings are anticipated to provide definitive insights into the research inquiries.

The data obtained was examined through two distinct phases. Initially, the interviews were thematically analyzed utilizing MAXQDA software to comprehensively grasp the perspectives of teachers on gamification. Additionally, the researcher employed SPSS software to analyze the quantitative data obtained from the post-test and delayed post-test, aiming to ascertain the impact of gamification on learners' vocabulary retention abilities. The scores of the tests were analyzed in alignment with Bloom's taxonomy. This framework serves as a fundamental component of the teaching and learning process, guiding the interpretation of results and providing valuable insights into cognitive development.

Finally, yet importantly, by conducting this research, the researcher aims to contribute to the existing body of knowledge and enrich research in educational gamification, particularly in the Algerian context. Also, the readers will gain an understanding of the research context and boundaries within the study, enabling them to address these aspects in future research endeavours. As for our belief, despite its roots in the past century, gamification remains a novelty in education until a new alternative emerges as a substitute for educational gamification.

CHAPTER ONE: FUNDAMENTAL ISSUES IN GAMIFICATION

Introduction

It is an undeniable fact that the majority of the human race, if not all, like to play and entertain themselves. Indeed, playing is embedded in our daily life; some recent studies even claim that playing is an innate treat in humans' daily routine, whereby it is considered a biological, psychological and social necessity (Wales, 2015). As a matter of fact, fun is part of the core pleasures of people. If you are to choose, would you use a common staircase or a piano staircase where you would enjoy melodies on your way to work every morning? If you ever had a loyalty card, extra free phone calls or received a free beautiful orchid plant for having used ecofriendly trash bins, then you are being unconsciously, exposed to gamification. The latter, throughout the current chapter, is the focal point of our discussion. Whereby the author starts by providing definitions to the key related terms so that to make the reader knowledgeable enough with the history of gamification. The next point depicts the theories on which gamification is grounded so that to understand how is gamification applied and what effect it has. After that, ambiguities will fade regarding similarities as well as the distinction between games and gamification. The next title tackles the game elements that form the basics of gamification. Then, the author explains the requirements that distinguish gamification from other game-like teaching/learning methods. The chapter ends with and explanation of the affordances and opportunities that would benefit the stakeholders of education such as motivation and engagement and which are framed by certain milestones. Eventually, the reader will come up with an understanding of the concept and its cohesive artifacts in education.

I.   KEY CONCEPTS AND TERMINOLOGIES

This section is devoted to the most prominent terms that relate to gamification. It gives the reader a clear understanding about games, game-based learning and gamification so that to make it easier for him/her to pursue reading the coming chapters.

1. The Notion of Game

Despite the fact that one can easily distinguish a game at first sight, the definition of a game may vary depending on the context. Taking, for instance, two children exchanging judo throws or fist bumps, the overall demeanour of the participants and their attitudes provide clues that they could be either engaging in playful interaction or involved in a serious altercation. Yet, the observer would find it challenging to define that playful situation. Defining games remains a challenging task.

The first known use of the word "game," according to the Merriam-Webster Online Dictionary, dates back to before the twelfth century. It is defined as an "activity engaged in for diversion or amusement" (Merriam-Webster, 2022). A game is diverting in nature, synonymous with playfulness, fun, and entertainment. Playfulness is evident in situations characterized by a joyful or amusing spirit. The interaction that occurs among the participants, whether single or in groups, for the purpose of jesting characterizes a game. In this respect, Kronisch (2016, p. 2) elaborates in her report: "A game is any interactive activity that the persons engaging in it experience as playful". This interaction could occur between two or more players, two groups of players, or even one player by himself.

Providing a concise definition of a game may lead to endless attempts to define what is not-a-game and what is playful. Other definitions refer to games in relation to rules,

participants, and goals. A game is defined by Abt (1978, p. 6) as "an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context". In the same sphere of thought, Becker (2017) defines a game as an interactive activity governed by rules that aim to achieve specific goals, allowing for measurable progress and a defined conclusion (p. 5).

Most definitions of games include features such as interactivity, rules, goals, quantified measurement of progress, and a definite ending (Becker & Nicholson, 2016). Some researchers define a game in relation to its components such as competition, goals, and rules. According to Kim et al. (2018), a game is an action or a set of actions involving one or more people, objects, or animals, typically in competition with others, following a specific set of rules to achieve a goal. The game's activity is undertaken competitively to determine winners and/or losers based on the rules of the game being played. Accordingly, the users of the game could be humans or animals, as playing is a part of their nature. In games, objects can also participate, taking for instance racing car toys. By pressing a button, the race begins and continues until the off button is pressed or the battery runs out.

Game is often defined in relation to one or more of its paramount design characteristics, be it a goal, rule, conflict, or the participants of the game. Yet, the intensity of one feature or element does not diminish the status or importance of another. The game designer and producer Sid Meier (n,d.) defines a game as "a series of interesting and meaningful choices made by the player in pursuit of a clear and compelling goal" (as cited in Kim et al., 2018, p. 15). The choice and willingness to play, to win, or to lose characterize the playfulness of a game and even the reasons for which the game is played. If the player's turns result in failure, they may choose to cancel or intentionally lose and start over for a chance at a winning streak. Other definitions focus on various aspects of a game, such as rules, participants, and competition. For example,

Groh (2012, p. 39) defines it as "a rule-based play with determined goals," while Dempsey, Haynes, Lucassen, and Casey (2022, p. 159) describe it as "a set of activities involving one or more players, with goals, constraints, payoffs, and consequences." Additionally, Salen and Zimmerman define a game as "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (2004, p. 113). The authors have used the word "artificial" to distinguish a game from real-life seriousness; artificial in terms of conflict, competition, rules, and results that are specific to the place and time where the game is being played.

Moreover, Goethe emphasizes the importance of receiving measurable feedback after following specific rules. Players are engaged in the game and act in a way that favors the acquisition of their desired feedback; as argued by (Goethe, 2019):

> Game is a rule-based system having a quantifiable
> and variable outcome, where diverse outcomes are linked
> with different values, the players attempt to influence the
> outcome, they feel emotionally attached to the outcome,
> and the result of the activity is negotiable
>
> (Goethe, 2019, p. 72)

To avoid ambiguity in defining the term, a game is often described in terms of its properties: interaction, rules, one or more goals, quantified progress, and a recognized ending (Becker, 2021). Hence, a definition that includes most features of a game would be that of Kim et al. (2018): "A game is an action or a set of actions, that includes one or more people, objects, or animals, usually in competition with others, that follow a specific set of rules, in order to achieve a goal" (p.16).

A broader definition of a game would be that of Goethe (2019): "a structured form of play, generally undertaken for enjoyment and often used as an educational tool" (p.14). Hence, rules make the act of playing more structured and often lead to learning through playfulness. Likewise, Clark Abt explains that games can be used to instruct, inform, and provide pleasure to participants since they: offer endless possibilities for mental and physical actions that incorporate freedom, intuition, and creative responses (Abt, 1978). A game, in essence, is governed by rules that result in outcomes. Players exert efforts to influence these outcomes, which are assigned varying values (Dyer, 2015).

It is worth mentioning that the setting or physical space where the game takes place is not a limiting factor for its occurrence; a game can be played anywhere as long as the space permits the game to be played to a certain extent. A football match, for instance, requires a stadium, but it could also be played in a house yard. Furthermore, technology nowadays allows the same football game to be played virtually across the entire planet, using a convenient connected electronic device.

2. The Notion of Game Based Learning

Scholars did not settle on one definition of Game-based Learning (GBL); games have long been considered a tool for learning, yet their integration into formal education dates back to the 1780s (Becker, 2017). As in (Salen & Zimmerman, 2004) a game is "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (p113). Added to that the notion of feedback, interaction, and emotion by Kapp (2012), which means that games evoke strong emotions and provide instant, direct, and clear educational feedback. The same components of rules and goals are referred to in Groh's definition: "a rule-

based play with determined goals" (p39). GBL could be defined simply as a type of gameplay with a defined learning outcome (Shaffer, Squire, Halverson, & Gee, 2005).

In her report, Becker (2021) refers to GBL as a process that "involves learning of knowledge, skills, and attitudes through the deliberate use of (…) games." (p.2). She continues by stating that these games are not necessarily designed for learning purposes; any game that serves an educational setting would be considered GBL. From the learner's perspective, it is the process and practice of learning through games. According to Becker (2021), GBL is a learning approach that seeks to improve learning effectiveness by incorporating games as either the lesson or part of the lesson with a specific learning objective.

In the Longman Dictionary of Teaching and Applied Linguistics, the term "games" is defined in the context of language learning and teaching, specifically in relation to Game-Based Language Learning (GBLL) or Game-Based Learning (GBL). The noun game in language teaching is defined as:

> An organized activity that usually has the following
> properties: a particular task or objective, a set of rules,
> competition between players, communication between
> players by spoken or written language. Games are often
> used as a fluency activity in communicative language
> teaching and humanistic methods.

(Richards & Schmidt, 2002, p. 219)

Additionally, the word game in computer assisted language learning likes learning with visuals tools to display the learning game: "rule-based competitive activities usually involving

a time limit and/or visual display features in which the player must acquire and/or manipulate knowledge in order to succeed." (Richards & Schmidt, 2002, p. 219)

The concept of Learning Games, educational games or games for teaching are all terms used to refer to GBL where players are "taught to do something" while playing (Goethe, 2019). These games are primarily designed to learn a new skill or subject, to reinforce or develop a pre-acquired knowledge. Serious games also fall under the umbrella of GBL, yet with more emphasis on the skill being taught or learnt rather than entertainment. Abt (1987/1970) coined the term Serious Games rather than games for learning, to refer to games with "an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement" (as cited in Chee, 2016,p.5).

Regardless of the purpose of play, learning is inherent in the game. Whether learning about the rules of play or mastering techniques to win, games necessitate learning. Hence, games serve as a mechanism for learning for both humans and animals (Becker, 2017). For instance, children acquire counting skills through activities like hide and seek, while mother animals simulate fights with their offspring in early stages of life to impart self-defence lessons. Even the games that are played for non-serious purposes do involve learning.

In edutainment, games are integrated into the teaching/learning process to achieve a pre-defined goal. The objective is primarily focused on the final outcome, with a focus on the process of attaining that outcome (Shaffer, Squire, Halverson, & Gee, 2005). More emphasis should be placed on achieving a balance between gaming and learning to ensure evenness in their use. If more emphasis is placed on games, it may lead to distractions from learning. Furthermore, learning in isolation should not be the sole focus; otherwise, it may lead to boredom. Hence, Game-Based Learning (GBL) balances the need to cover the subject matter

and prioritize gameplay (Plass, Homer, & Kinzer, 2015). Similarly, other scholars put more emphasis on retention "balance subject matter with gameplay and the ability of the player to retain and apply said subject matter to the real world." (edtechreview, para.1, 2013).

3. The Notion of Gamification

People often confuse the meaning of gamification; it is thought of as excessive gaming. However, it is far more complex than simply using an existing game. Rather, gamification refers to any effort made to turn a potentially tedious task into a game. This concept is not new in practice, but the term gamification entered the English lexicon in the 21st century and it involves integrating game elements such as points and reward systems into tasks to incentivize people to participate (Merriam-Webster, 2022). According to Deterding, Dixon, Khaled, & Nacke (2011) gamification refers to the use of game elements in non-game contexts. Harris & O'Gorman (2014) define gamification as "The presence or addition of game-like characteristics in anything that has not been traditionally considered a game" (p. 8).

Gamification's primary goal is to increase the productivity rate when performing tasks that are not inherently enjoyable (Goethe, 2019). The term "gamification" was first coined in 2002 by the gamification pioneer Nick Pelling in the field of commerce. It made its first appearance in the digital marketing industry in 2008 (Kim, 2015; Gamification, 2024; Hernández et al., 2021, p. 2; Christians, 2018). It is about utilizing game properties to achieve specific business objectives. According to Gabe Zichermann, the use of gamification is impactful in situations where consumers or employees are distracted or disconnected from their goals and objectives (2014). In the same vein, Prakash and Rao (2015) define gamification as "the process by which gaming concepts are brought to the real world tasks associated with real

people" (p. 35), this is to boost the users' performance, behaviour and engagement. Further, Landers (2015) adopts Detering's definition, which states that game characteristics are derived from games and used independently to enhance other processes (2015, p. 6).

The utilization of gamified thinking covers a wide range of fields. For instance, in the field of commerce, gamification is also defined as the "application of game-like accelerated user interface design to make electronic transactions both fast and enjoyable" (Marczewski, 2015). Further, Grove (2011) provides a general definition that encompasses all gamified activities; she specifically defines gamification as "set of activities and processes to solve problems by using or applying characteristics of game elements" (2011, para. 3). In accordance with the above definition, we understand that applying gamification involves specific actions aimed at addressing issues often related to engagement and productivity. The definitions focus more on the characteristics of game elements rather than simply on the use of points, badges, etc. In the same scope, Prakash and Rao (2015) provide a functional definition:

> Gamification is the process by which gaming concepts are brought to the real world tasks associated with real people. To make routine tasks (….) lively and interactive, organizations have started taking the help of game design techniques, game thinking and game mechanics

(2015, p. 35)

That is to say, it is not playfulness that makes people tackle tough tasks more actively and dynamically, but rather the game-like environment that makes the difference. As Rosen (2013) explains, gamification is the process of incorporating elements we enjoy from games

into non-game contexts. His adopted definition is: "an easy-to-use Web- and mobile-based learning platforms (…) [that] take the boredom out of long training sessions by gamifying the entire process. A training manual is replaced by an interactive game that allows participants to win awards and be acknowledged." (paragraph.10)

Gamification is theoretically similar to rewards; it motivates people to concentrate on actual tasks in order to earn these rewards (Nicholson, 2015). The motivational power of games is cleverly utilized to encourage participation, persistence, and achievements, as well as to promote a business, service, or product. (Richter, Raban, & Rafa, 2015). According to the platform Bunchball Nitro (2016), a leading company in gamification, "gamification takes something that already exists – a website, a training tool, a CRM, an online community, or other enterprise system – and integrates game mechanics to motivate participation, adoption, and loyalty" (Biworldwide, 2016. paragraph, 2)

In order to foster positive behaviour in terms of engagement and motivation, gamification incorporates the qualities of games—regardless of the type of game—known as elements, mechanics, or design characteristics and integrates them into educational or work settings. As explained by Danelli (2015): "Gamification is about identifying structures and behavioural procedures in games (video games, board games, party games, or even sports!) and replicate them in educational or work settings to manage audience behaviour" (Danelli, 2015, p.1). Moreover, gamification is known to be a tool used to generate revenue especially in the field of marketing (Danelli, 2015, p.2).

To illustrate the concept of gamification and the application of gaming in serious contexts, imagine two or more boys leaving school and racing back home to see who can ring the doorbell first. This scene is serious in essence, yet, it includes game features such as

participants, challenges, competition, goals, rules, and even the choice to participate, to win or lose. Metaphorically, there is a sort of kinship between gamification and the Maggi bouillon cube. The former adds taste and flavour to our food, just like gamification, which adds zest to serious experiences and enhances behaviour.

II.   HISTORICAL BACKGROUND OF GAMIFICATION

Gamification did not emerge in a blink of an eye. It existed long before 2002 under different labels and forms (Christians, 2018). In fact, gamification was first coined by Nick Pelling, who is a computer programmer and the creator of computer games like Arcadians (Kim, 2015). He contributed to creating game-like interfaces for commercial electronic devices such as ATMs and vending machines. By 2010, this approach had become widespread in business, particularly as a marketing strategy (Gravesen, 2011.).

The primary benefit of gamification is to enhance customer loyalty and ensure that the client will return to purchase the product or service. In customer management, it took the form of loyalty programs, loyalty cards, club cards, and other designations. This is the earlier form of gamification. It implies that the customer or the cardholder receives rewards in the form of points, free services, or goods for having purchased a certain number of goods or services (Prakash & Rao, 2015). Gamification has roots that extend far back before its integration into education. The marketing industry applies gamification techniques as a strategy to maintain customer loyalty and encourage positive customer behaviour (Huotari & Hamari, 2012). Further, gamification flourished later on Google in 2011 (Healey, 2019).

According to Grove (2011), gamification is following a trajectory similar to social media. In the early twentieth century, social media began to be adopted by almost all entities to leverage its benefits. Similarly, game mechanics embedded in gamification would soon have

the power to help these entities achieve their desired goals more effectively (Grove, 2011). Taking for instance the LinkedIn progress bar for profile completion, along with the completion rate in percentage. Encouraging users to log in and update their profiles can attract more visitors. LinkedIn even sends regular emails to inform users about the number of visitors who have shown interest in their profile. For professional reasons, users are intrinsically motivated to view other users and even display an active status, attracting more visitors and potential head-hunters.

If you happen to be listed in the top five employees of the month, then your company is gamifying its workplace in disguise. The difference between now and then lies in the sophistication of how gamification is applied. Now we can track our progress, monitor our frequency of use through constant notifications, view progress bars, and compare our rates with others. Back in the day, loyalty programs were implemented in their simplest forms, using stamps, points, cards, or badges in their raw forms. Social sharing and broadcasting were less common during the previous time (Harris & O'Gorman, 2014).

As a matter of fact, gamification did not undergo a deliberate evolutionary process. According to (Landers et al, 2018), it has spread across different arenas over the decades, beyond just games, where researchers trace the emergence of gamification back to the early 19th century when badges and incentive systems were the primary applications of this concept. Yet its evolution was not steady.

As per the evolution of gamification, its history is approached from different perspectives. For the purpose of our study, the evolutionary process of gamification is depicted into four phases; as adapted from the work of (Christians, 2018):

1. **Pre-Gamification Phase: Gamification as a Ghost**

According to (Christians, 2018), the badge system, which is part of game mechanics, originated in 1896 in Alabama when Thomas Sperry and Shelley Hutchinson founded the S&H Green Stamp company. Customers receive stamps whenever they shop at retailers and grocery stores that are members of the S&H program. The number of stamps depends on the purchases. Once the stamps were collected, they could be redeemed at the S&H for goods from a catalogue that contained a considerable number of items provided by the company. This system encourages people to make their purchases at retailers who are part of the program to take advantage of the incentives (Christians, 2018). Similarly, Tombola is a form of loyalty program that includes home appliances, lottery, and grocery items too.

Another early form of gamification was the badge. In 1908, the Boy Scout movement was founded in America. The movement adopted the badge as a reward system for accomplishing missions or activities (Harris & O'Gorman, 2014). The scout members adorned their uniforms with the collected badges as a symbol of proactivity and accomplishment; more badges signify that the holder has taken part in many activities. The badge system is the primary symbol of the scout movement. It is important to note that badge collection did not result in a reward or a measurable outcome. Else, another form of gamification that has long existed is airline reward programs.

2. **Gamification Under Development: a Foetus in an Embryo**

At this stage, games started to delve into serious matters beyond leisure and entertainment. In 1973, game elements were seriously considered in workplaces to enhance employees' performance because games possess qualities or elements that, if applied in serious settings, could significantly enhance performance (Coonradt, 2007). How would that be

possible? Teammates in a game play together and make all necessary efforts to achieve a common goal known to all players. Meanwhile, constant feedback and scoring system is provided to demonstrate the progress and performance of the team. Further, Coonradt (2007) believed that workplace mentality or culture should be transformed to resemble game thinking in order to boost sales rates. He made that claim when he noticed that productivity in the US had diminished compared to higher sales in recreation and sport items.

In later years, social online gaming flourished, thanks to Roy Trubshaw and Richard Bartle, who created in 1978, the first Multi-User Dungeon game, as a recreational activity that involves cooperation and collaboration (Bartle, 1999). Gamers approach games from different perspectives, affected by the motivation for choosing a particular game; they could be either explorers, socialisers, achievers or killers as categorised by (Bartle, 1999).

In the 1980s, academics became interested in the power of video games and the benefits derived from applying game elements in other areas. Thomas Malone wrote papers on that subject, specifically focusing on gamifying education. He was among the first academics to advocate for gamification (Coonradt, 2007).

The "Serious Game Initiative" was launched in 2002 by the Woodrow Wilson International Center for Scholars. The main purpose of this notion was to enlighten people about serious issues in politics, the environment, health, etc. These scholars aimed to demonstrate the practical applications of games in fields beyond entertainment. The idea is neither a game for fun nor gamification.

3. The Gamification Era: Birth Stage

The year 2002 gave birth to the concept of gamification. According to (Bunchball, 2010), Nick Pelling coined the term "ugly duckling" and it was considered unattractive for such a promising concept like 'gamification'. Pelling is a game designer who had a mission to create gamified interfaces for ATMs, vending machines, and similar devices. The idea was to make electronic transactions easy, fast, and enjoyable. When interacting on one of his blogs, he explained: "games-platform-publishing-fication" and "games-interface-ification" (Pelling, 2011). This means that the electronic device functions as a publishing platform with an interactive and responsive interface.

After that, the leading gamification project Bunchball, was founded by Rajat Baharia (Bunchball, 2010). This platform was created to promote online engagement through game mechanics. Banchball was contacted to contribute to the creation of the Dunder Mifflin Infinity site for the NBC channel to keep television viewers engaged with its TV shows. That was the first online gamified platform. Shortly afterwards, the Chores Wars game was launched. The latter was quite helpful to parents or flatmates as it encourages people to do household chores and advance on the platform accordingly. This game was designed to create a fun interactive and competitive atmosphere while doing the daily house chores.

According to (marketingplatform, 2022), gamification was also implemented in other areas such as learning, through Quest to Learn for 6th graders and in geography through Foursquare. The app is equipped with a map that enables users to locate and search for places on their devices. If a user repeatedly points to the same location, they become the mayor of that location. Interestingly, foursquare proved to be profitable not only for its creators but also for other companies that purchased and benefited from the data generated by the users.

The Speed Camera Lottery is an innovative initiative that has proven to be a successful example of gamification in addressing real-world problems. According to (Grove, 2011) the idea was initiated by Kevin Richardson based on Volkswagen's Fun Theory. This camera was placed to capture drivers who behave well on the streets. The registration numbers are recorded to participate in a lottery, and winners would be awarded for complying with the driving law. The awards are generated and financed by taxes of the people who were caught speeding on the streets. The objective of the idea was not only to promote fun but also to encourage adherence to speed limits and ensure safer roads. It was so successful that it managed to reduce driver speed by 22% in Sweden after just one week of implementation (Grove, 2011).

4. Post Gamification: The Outbreak

It is in 2010 that gamification was called for loudly and publicly on stages and books. Gamification and gaming have become a field of research for so many. Starting by TED talks to summits and conferences, Jane McGonigal (2010) advocates the notion of gaming mindset to solve real-life contemporary worldwide issues. In McGonial's TED talk in 2010, she explained her vision of a world well built with gamers because according to (McGonigal, 2010): 'Gamers always believe that an epic win is possible' and so is the case with everyday life blocks.

In 2012, the research company Gartner made predictions that by 2014, more than 1000 global companies will gamify their strategies, which was the case with Apple, Amazon and Mozilla. Despite some failure in gamifying some businesses, disengagement remained a recurring phenomenon and gamification was still believed to be a cure. In accord to a study by Gallup, 29% of the millennials are engaged in their work. The reason is that the millennials are gamers and are driven by gamified apps and mobile or computer games. Thus, for gamification designers, it requires some game mechanics to

reengage them. For others, incentivization is not a magical stick to motivate someone to perform well in a task (Becker & Nicholson, 2016).

III. AVOIDING MISCONCEPTUALIZATION: GAME-BASED LEARNING VS GAMIFICATION

There are ongoing debates about the correct definition of games in education due to the diverse and extensive learning environments. The distinction between gamification and game-based learning is blurry. There is an unfilled gap in making a clear and grounded distinction between gamification and other forms of learning games (Landers, 2015). As discussed earlier in this chapter, Game-Based Learning utilizes existing or newly designed games to achieve learning objectives, while gamification incorporates game features to enhance the learning experience. In order to distinguish game-based learning from gamification, it is important to depict their similarities and the common components they share. Accordingly, both GBL and gamification share the criteria of fun and enjoyment, which ultimately lead to motivation and engagement.

Taking motivation as an example, it is a common feature shared by gamification and (GBL). Learners often lack the willingness to perform a particular task. Hence, gamification and (GBL) serve as extrinsic motivators or factors to encourage learners to engage in tasks, especially when these tasks lack action or dynamism. In educational settings, gamification and Game-Based Learning (GBL) are distinguishable, yet they overlap and share game elements that create playfulness in a serious context, such as the classroom. Playfulness characterizes a learning atmosphere where learners acquire knowledge through entertainment or learning through games or play, giving rise to the term "edutainment" (Chilingaryan & Zvereva, 2020). In other words, educational games are designed to support learners in their pursuit of knowledge

and skill acquisition inside and outside the classroom (Hussin, Syed Ahmad, & Yusri, 2019). There are two types of educational games: they could be either conventional, played using dice, sticks, or cards, or computer games played online or offline using digital consoles like computers, tablets, or smartphones.

1. The Affordances of Gameplay in Classroom Context

Games for children are a cherished cultural tradition, an essential part of life. They are the directors, the actors, and why not; the spectators of the game they play. They also have the will to choose who is the winner or the loser for their amusement as spectators. The child immerses himself in different lives through games, where he enjoys experiencing various scenarios and eventually acquiring skills that will be beneficial to him in the future.

In the task of designing suitable teaching materials, Norman (1981) argues that no material would be as effective for children as games, as they will learn happily. An environment characterized by playfulness and gamification develops the Social and Emotional Learning (SEL) skills of learners. This includes empathy and prosocial behaviours (Singh & Duraiappah, 2020). Some games teach players the importance of teamwork, collaboration, and critical thinking. Examples of such games include World of Warcraft, Minecraft, and Lord of the Rings (Edtechreview, 2013).

The primary goal of learning games is education rather than entertainment, while gamification uses fun as the roadmap or building blocks for learning. As argued by (Fuscard, 2001): "games have a special role in building learners' self-confidence" and "they can reduce the gap between quicker and slower learners" (As cited in Goethe, 2019, p.14). When interviewed about her experience with gamified university courses, Walker (2016) from Clemson University emphasized that gamification and (GBL) keep learners on the learning

track by discreetly combining difficult content with opportunities to practice and foster 21st-century skills like teamwork, collaboration, communication, and leadership, to name a few (Walker E. , 2016). Furthermore, creativity, decision-making, critical thinking, inclusion, and learner-centeredness are all qualities associated with playful learning (Teacher Academy, 2020). In this regard, news about the Bill and Melinda Gates Foundation's initiative spread widely in 2011. The initiative involved developing (GBL) tools for children in the US, costing around 20$ million (Gates & Gates, 2020).

Student engagement and an increase in learning outcomes are among the many promises of game-based learning (Farber, 2017). It also helps improve learning attainment outcomes (Dabbous et al., 2022). In addition to increased engagement and motivation, learners benefit more from gamified learning on various levels. They can enhance recall and retention, receive instant feedback on performance and progress, foster collaboration, facilitate behavioural changes, and monitor progress (Kim et al., 2018) through the gamification tools available.

2. Common Features in Gamification and GBL

As explained above, there is a quite thin line between both concepts in education; a line that could go unnoticed. There are some features that exist in gamification as in GBL. The kinship occurs at the level of the following features:

A. Engagement:

Studies have shown that boredom is one of the reasons for school dropouts. Education practitioners advocate the use of full-fledged games or gamified environments to keep learners engaged and motivated. This is achieved through clear goals, tasks, feedback, and challenging levels (McClarty et al., 2012). In other words, ongoing engagement is related to a sense of

accomplishment, as well as through the accumulation of points or game rewards (Heidi, n.d.) Academic achievement, motivation, and social and emotional learning are also highly affected by engagement (Kim et al., 2018). Further, Van Grove (2021) refers to gamification as the process of incorporating game thinking to solve problems and engage audiences (Grove, 2011).

B. Motivation:

Educators often encounter learners who are demotivated to learn a new skill, especially one that they perceive as irrelevant. In their attempt to stimulate interest, teachers make use of games that enhance the learning environment as a transitional way from the traditional learning atmosphere. Whether used at the start, middle, or end of the class, games create a unique learning experience (Becker & Nicholson, 2016). Else, Gamification involves learners immersing themselves in a world of avatars and engaging in a competitive environment defined by rules and badges, to name a few. Remarkably, learners are intrinsically motivated in a Game-Based Learning (GBL) environment, but extrinsically motivated in a gamified learning context.

C. Game elements:

Both gamification and GBL are developed relatively similarly. Gamification, although not considered a game, incorporates game design characteristics such as aims, rules, conflict, challenge, competition, levels, winners/losers, and feedback, among others; as stated by Jane McGonigal, "all games share four defining traits: a goal, rules, a feedback system, and voluntary participation" (2011, p. 21). These game elements are also part pf GBL. Hence, turning a traditional class into a more engaging competitive setting is the major similarity between gamification and Game-Based Learning (GBL).

3. The Features that Make the Distinction between Gamification and GBL

In an article, Ritter (2015) uses a metaphor to provide a clearer explanation of the relationship between GBL and gamification, likening GBL to the cake and gamification to the icing. In essence, the product remains the same, but the icing will effortlessly entice people to consume the cake. Gamification is essentially a game in disguise within a serious context. So, where does the difference lie? The table below illustrates the distinctions between GBL and gamification in a learning environment concerning form, content, and setting.

Table 1-1 The difference between GBL and gamification

	Form	Content	The learning setting
GBL	-A full-fledged game with a predesigned learning objective the games can be ready-made or redesigned to fit the content or the learning objective	-learning is the game itself or learning is entailed in the game. -The learner is aware of the game he is playing	-A game with a learning objective with less emphasis on extrinsic rewards, since the learners is intrinsically motivated by the factor of playfulness. -The setting is serious performed through fun. -Feedback
Gamification	-Content designed to look like a game using the design features of game mechanics. -The design is not necessarily	-The content is unchanged and is not necessarily a game/ playfull. The lesson could be in form of tasks designed and performed based on	-The focus is more on extrinsic motivation or the incentive system to keep the learner engaged enough to perform tedious tasks and

	influenced by the learning objective.	the design mechanics of games	promote productivity or proactivity.
	-More emphasis is put on rewards, competition, challenge, leaderboards etc.	-The learners is completing or performing tasks rather than playing a game.	-The setting is characterized by fun for a serious purpose. -Feedback is constant.

Both terms differ in their implementation of game mechanics. From Lander's (2015) perspective, both games and gamification share common game elements and are thus akin to each other. However, the difference occurs in the degree to which the game element is applied. According to Landers (2015), "gamification involves the identification, extraction, and application of individual game elements or limited meaningful combinations of those elements" (p. 14). Games, however, apply all elements to varying degrees. The design of the learning game, also referred to as an applied game, is directed to fulfil a serious aim rather than for entertainment (Kim, et al. 2018). The strategy of gamification involves combining elements and heightened incentives such as stars, badges, ranks, and achievement bars to motivate learners to put more effort into tasks that they may find demotivating or pointless (Deterding, Dixon, Khaled, & Nacke, 2011). The learning content and the objectives, however, remain the same.

The primary goals of Game-Based Learning (GBL) and serious games are learning and behaviour change (Becker, 2017). In Game-Based Learning (GBL), players are aware that they are playing and learning simultaneously, while in gamification, they engage in learning-related tasks within an unconsciously playful environment, essentially a game in disguise. Paul Gee (2005) mentions a key differentiating feature in gamification, stating that learners "perform

before they are competent" (p. 37), whereas in Game-Based Learning (GBL), prerequisites in the subject are necessary to participate in the game.

Figure 1-1: Differentiation between GBL and gamification
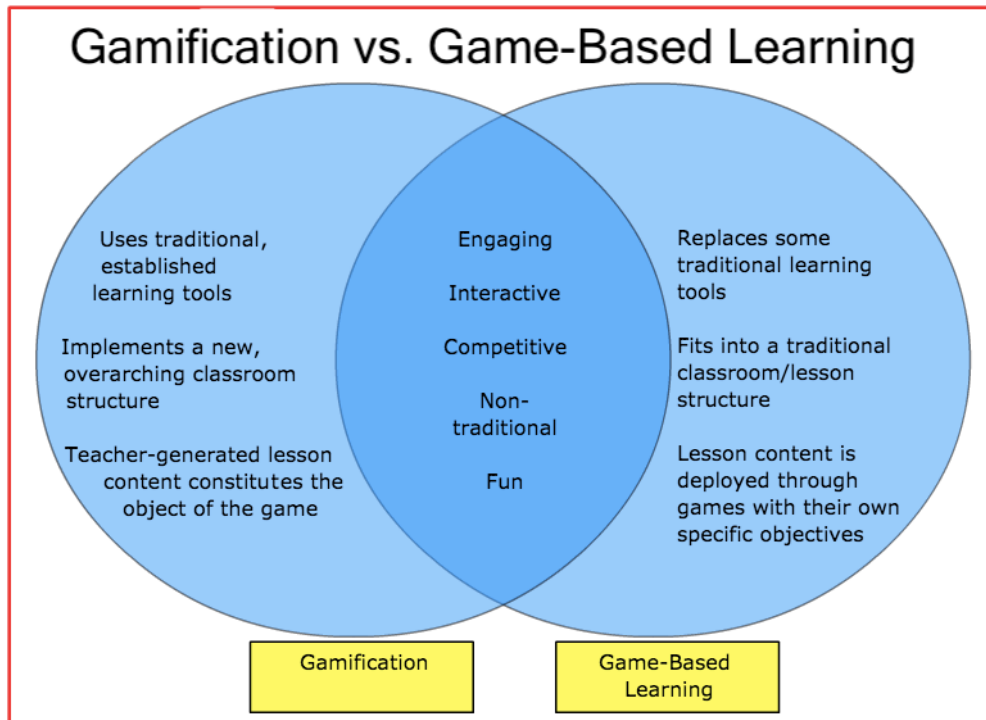
Note: Reprinted from (LengendsofLearning, 2018, para. 18)

Unlike serious games, gamification practitioners do not seek to provide learners with instructional content, its target or objective is rather to influence behavior or attitude and eventually improve learning: "it is intended to improve pre-existing instruction as a consequence of that behavioral or attitudinal change." (Landers, 2015, p8). Serious game can also be gamified when played on mobiles and computers with an addition of elements of rewards, timers…etc Also, the process of GBL consists of integrating games into the learning process in order to help learners actively experience their learning (Cojocariua & Boghian, 2014). What distinguishes gamification from serious games is that the latter "are typically

designed to fulfill the role of instructor by actually providing instructional content to learners"
(Landers, 2015, p 13). Furthermore, games are not considered as a key to knowledge acquisition
or to improve learning and cognitive skills, it is rather the game environment that enables
effective learning (Pivec, 2009).

IV.   THEORIES OF GAMIFICATION IN EDUCATION

Numerous contributors are active in the field of gamification across various fields. In
education, the proliferation of gamification is attributed to pioneers in research and
development, as well as game design. Salen, McGonigal, and Zichermann have devoted
considerable efforts to promote 'gameful thinking' in educational contexts (McGonigal, 2010).
However, game design thinking and gamification are rapidly evolving, making it challenging
for researchers to keep up with the pace and generate sufficient evidence-based
recommendations (marketingplatform, 2022). Hence, the literature on educational gamification
lacks some theoretical foundations (Dichev & Dicheva, 2017). Further, evidence on the impact
of game elements and specific game mechanics on motivational, behavioural, and learning
outcomes is relatively scarce (Krath et al., 2021). In order for researchers to make evidence-
based claims, it is crucial to understand the theories underpinning gamification. Nevertheless,
Landers (2015) argues that no learning theory has been developed solely for gamification so
far. Moreover, in order to clearly comprehend the mechanisms of gamification and the related
outcomes, there should be a theoretical framework based on empirical studies in educational
gamification. Nonetheless, pre-existing behavioural theories, such as motivation or
engagement-related theories, can explain the driving effects of gamification.

Gamification impacts behavioural aspects such as motivation and engagement, which ultimately lead to positive learning outcomes (Landers, Bauer, Callan, & Armstrong, 2015). Engagement and motivation are often used interchangeably, yet they are conceptually close relatives where engagement is an observable expression of motivation (Rigby, 2014). Coming to a clear understanding of the design, process, and promises of gamification is not an easy task. Therefore, many foundational theories are established to tackle games in learning and to study the outcome generated from playful leaning. These learning theories are crucial for the development of instructional games. They assist all game stakeholders, including game designers, developers, and instructors, in designing, selecting, and applying game elements. Hence, research based on theoretical importance and practical significance enables a good understanding of the conditions that enhance or diminish human potential (Ryan & Deci, January 2000). Theories that deal with gamification mostly derive from the study fields of cognitive psychology, human-computer interaction, and social psychology (Krath, Schürmann, & Korflesch, 2021).

1. **Motivation:**

It is one of the engines driving the functionality of gamification. It is characterized by an arousal of the individual's behaviour experienced at the level of the mind or emotions, resulting in behavioural change (Kim et al., 2018). Motivation is at the core of psychological issues, as it involves biological, cognitive, and social regulation (Ryan & Deci, January 2000). Intrinsic and extrinsic motivation are two major types of motivation. The former refers to the act of doing something for its own sake, such as interest, pleasure, self-actualization, etc. Whereas the latter is influenced by some external factor(s) to take action. These influencing factors could include rewards, social recognition, or punishment, among others. Intrinsically motivated individuals are self-endorsed or self-authored, exhibiting interest, confidence, and

excitement. Comparatively, someone whose motivation is extrinsic is merely under external control or influence (Ryan & Deci, January 2000). Gamification is based on extrinsic motivators such as grades, extra points, and rankings. However, if implemented carelessly, it could lead to unintended consequences. Educators should alternate between both types of motivational strategies to avoid overusing one over the other. Good understanding of learners' styles and needs, along with a suitable choice of the right motivator, ensures a successful gamification strategy (Kim et al., 2018). Gamification is mostly based on motivation, which in turn affects learning behaviours, including "willingness to engage, persistence to achieve, time on task, and efficacy of gamified interventions" (Healey, 2019, p.12).

2. Flow Theory

The flow theory explains the level of engagement of learners in task performance. It is explained by Csikszentmihalyi as a "holistic sensation that people feel when they act with total involvement" (cited in Krath et al., 2021, p. 6). Furthermore, Shernoff (2013) relates engagement rates to the level of interest and enjoyment experienced while performing a specific job. It is also characterized by affective, behavioural, and cognitive involvement. This epistemology of engagement is related to the theory of flow. Flow is observed when a learner is fully engaged in a challenging and enjoyable activity (as cited in Kim et al., 2018). Researchers study the state of flow to measure engagement and enjoyment (Becker, 2017, p. 48). Additionally, maximized learning occurs when a learner is in a state of flow; in other words, they invest their highest abilities in tasks under their control. If the challenge requires higher or lower skills, learners might experience feelings of anxiety or boredom. The educator should increase the difficulty of the challenge when the learners are bored or lessen the degree of the

challenge when learners are too anxious to perform the task. Based on Csikszentmihalyi's flow theory, fully engaged learners can be observed through concentration and focus, loss of self-consciousness, perception of time passing unnoticed, and reduced anxiety. To ensure a state of flow, learners are not engaged unless the learning experience entails clear goals, constant feedback, and a control of the activity assured by challenge-skills balance (As cited in Kim et al. 2018, p. 24). Learners are not required to be experts in specific areas to enter a state of flow. Nonetheless, they could be fully immersed in a learning situation characterized by game elements, which is referred to as the optimal experience. It is important to note that each type of engagement stimulates different behaviours in specific learners in various settings (Plass, Homer, & Kinzer, 2015, p. 260).

3. Self-determination Theory

The Self-determination theory deals with the causes of human behaviour as well as the context that fosters human development, performance, and well-being. The Self-Determination Theory (SDT) is a human behavioural approach that investigates inner psychological needs such as competence, autonomy, and relatedness (Ryan & Deci, January 2000). Ryan and Deci first developed the Self-Determination Theory, (SDT). It is one of the theories that motivation is built on, as it relates to the innate psychological needs of individuals. Competence, autonomy, and relatedness are the driving factors of self-determination theory (Becker, 2017, p. 45). It is one of the most cited references for research in gamification and game-based learning; it has been referenced in approximately 82 different studies (Krath, Schürmann, & Korflesch, 2021). It addresses the basic psychological needs of autonomy, competence, and relatedness. In gamification, autonomy is exemplified through customization, as it provides participants with

the freedom to choose their development pace. Teams and collaboration foster a sense of relatedness, while achievements and badges symbolize competence (Krath et al. 2021). Each of these models could be used to evaluate games, student motivation, and the impacts on subsequent learning and achievement (McClarty et al. 2012).

The Self-Determination Theory (SDT) emphasizes the importance of the relevance of behaviour. Learners engage with the learning material when they perceive its utility and usefulness, leading to intrinsic motivation (Dicheva, Dichev, Agre, & Angelova, July 2015). The intrinsic motivation is a good reflection of human's positive potentials. It encompasses the desire to challenge oneself, to explore, to seek novelties, to extend and improve one's capacities, to practice, and to learn (Ryan & Deci, 2000). In the gameful learning world, learners are intrinsically motivated when they feel competent, autonomous, and connected. One common criterion between gameplay and learning is the objective, whether it is a grade or a goal to achieve. Both rely on motivation and the desire to achieve that goal (LengendsofLearning, 2018). Moreover, gamification more often relies on incentive systems to ignite learners' motivation. Learners who are intrinsically motivated by personal inclinations demonstrate a sense of activity, inquiry, curiosity, and playfulness even without rewards (Ryan & Deci, 2000).

4. Cognitive Load Theory

Arguably, cognitive load refers to "learners' ability to process information given the current demands placed on working memory" (Cook, Zheng, & Blaz, 2009, p. 36). It is based on the assumption that human working memory functions more effectively when there is less demand and pressure on cognition. Hence, Sweller (1988) asserts that learning is effective when the cognitive load is lessened, which occurs when learners are provided with aids that facilitate acquisition. (as cited in Becker, 2017, p. 6). Processing information requires more resources

from working memory, which increases cognitive load. In the presence of learning facilitators such as audio scripts, segmented learning items, and other visual aids, the learner's attention is easily directed towards the learning goal, minimizing external distractions. The mechanisms induced in games help learners memorize better (Becker, 2017).

Gaming, with its multimedia qualities, enhances cognitive functioning and influences the continuous thinking process through problems or obstacles that gradually increase in complexity and intensity (Chaarani, et al., 2022). If the game is not designed thoughtfully, it will not engage the player. In a study related to learning mathematics, Kebritchi (2008) argues that playing games has a positive effect on the learning outcomes and cognitive gains of learners. This is because learning is combined with fun, challenge, adventure, and exploration.

V. THE MECHANISM OF GAMIFICATION

A game is characterized by a goal to be achieved, limiting rules to reach the pre-defined goal and feedback on the progress towards the goal. Sailer , Hense, Mayr, & Mandl (2013) provide the components of game: points, badges, leaderboards, performance graphs, meaningful stories, avatars and teammates. These components are part and partial of gamification and are referred to as game design elements. Levels or progress bars show an increase amount of points or the level of difficulty. In addition to quests, virtual goods and avatars (Dicheva , Dichev, Agre, & Angelova, July 2015 and Seaborn & Fels, 2015)

The intensity of specified element(s) defines the degree of difficulty of the game. This is to keep the player hooked in the game and put him/her in a state of flow (Hamari et al., 2016). Some games include continuous progress in difficulty and require players to go through a

number of challenges in order to level up or to get a particular grant. Others increase the number of rules or require players to start from scratch when losing in one of the challenges. These mechanisms add complexity to the game; as asserted by Prakash & Rao (2015) "The complexity of games is determined by the mechanics between the various elements within a game" (p. 42) . Game mechanics are utilized in order to induce the same intensity of interests in areas other than games; from which coined the term gamification (Healey, Gamification, 2019). Also, "The effect of incorporating game elements into instructional efforts is likely to vary in both proximal and distal learning outcomes, depending upon the specific game elements used and the contexts in which they are used." (Landers R. N., 2015, p. 2). The inclusion of one or more game elements in any serious /learning context is done for a purpose. Either to aesthetically adorn the setting or to reach a particular behaviour al or cognitive objective. Game elements – mechanics, dynamics, and emotional appeal – are deliberately incorporated to encourage motivation, time spent in the game, and the sense of flow (Healey, 2019). The elements that characterize a game are utilized to motivate learners to keep on doing the learning task and complete it; "the more learning activities they complete the more entertainment they receive" (Charsky, 2010, p.178).

For the purpose of understanding game elements, it is advised to clarify more the concepts of game mechanics and dynamics in addition to the psychology of the player and see the game from player's perspective, since games are played for a reason.

1. **Who Play Games and Why?**

Along with the variety of game types, player also fall under different categories. The state of mind of the player as well as his psychology affect his choice of the game and the reason

for his choice. Thus, a player might be categorized in more than one type. Within the viral spread of video games in the early 20th century, Bartle (1999) made a crucial attempt to study the player rather than the game itself. He identified four player types; each having different and varied characteristics from the other.

Figure 1.2: Bartle's user types
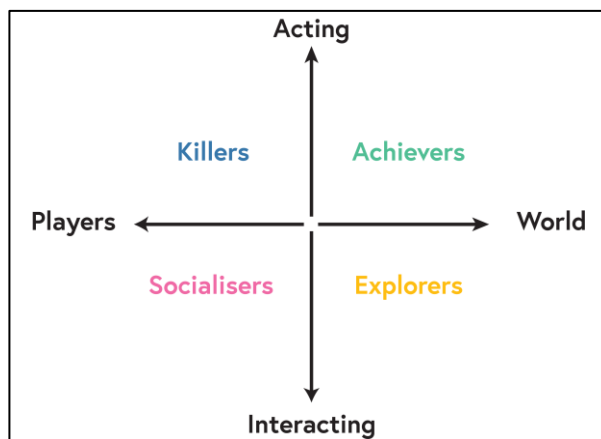
Reprinted from: (Bartle, 2009, p. 6)

Game experts have identified four types of players, each playing a game for a reason. In (figure2), Richard Bartle explained the taxonomy of players in his article (Bartle, 1999):

a- Achievers: they play for the sake of winning or collecting points or awards or gaining a status.

b- Socialisers: people often take part in a game for their social relationships rather than interest.

c- Explorers: are players who seek new adventures and oppotunities

d- Killers: they are players who play to won, take the first place and defeat others.

The aforementioned players do adhere into the play experience for a number of reasons depending on the psychology of the player and the need he wants to quench. Unless it is an addiction, there are three chief reasons that have been agreed on (Prakash & Rao, 2015). Gamers play for the sake of:

a- Fun: to escape reality or to get out of the routine zone

b- Competition: to keep enthusiasm alive

c- Learning: to enlarge the scope of knowledge and skill

Apart from entertaining games, there are two divisions for ludic games: didactic games and educational games. The latter are played informally and entail an educational finality. Game assists the player to indirectly learn or develop a skill while playing. The didactic game however is rather instructional with a defined learning outcome (Becker, 2017). The focus is more on the subject matter rather than playfulness; eventually the player applies what he has learnt in real situations outside of the learning context. The instruction here is known as game-based learning; or GBL in short. Different perspectives are used to approach GBL: educational method, didactic procedure and organization of the teaching-learning activity (V. M. Cojocariua & I. Boghian, 2014).

2. Game Elements

They are components that make up a gamified environment. Implementing one or more of these pieces in education, creates a novelty in education; mainly within the context of EFL classrooms. "Gamification is regarded as a process of setting and using elements of games in formal contexts or serious fields of profession which are not related to game playing originally" (Tan, 2019, p. XVIII). Landers (2015) consider gamification and serious games as complementary approaches that apply the same game elements but differently. Healey also,

points to three most common mechanics implied in gamification: Points, badges and levels (Healey, 2019). Gamifying education is done with the idea in mind that both games, gamification and education have some features in common. That includes rules, goals and clear ending along with interactivity and a quantifiable measure of progress (Becker & Nicholson, 2016).

Since games are played either individually or commonly, game mechanics can be classified into self-elements and social elements. The former includes badges, trophies, badges, storylines, time restriction, aesthetics and virtual goods. Whereas the latter refers to leaderboards, interactive cooperation, storyline and virtual goods. In review study conducted by Dicheva et al. (2015) on research studies between 2010 and 2014, it was revealed that badges are the mostly used game element, followed by leaderboards, points, levels, virtual goods, and avatars (Park & Kim, 2019).These elements comprehend both mechanics as well as dynamics. These game elements "are identified from games and used in isolation or in limited combinations to improve other processes" (Landers, 2015, p. 6). Game elements which encompass mechanics, dynamics, and emotional appeal are deliberately incorporated to encourage motivation, time spent in the game, and the sense of flow (Healey, 2019). The elements that make up the design of gamification are categorized into three main elements; dynamics, mechanics and components as explained by (Werbach & Hunter, 2012, p. 82) who scrutinized game elements into a pyramid shape (Figure3.1).

Figure 1.3:

Game elements model
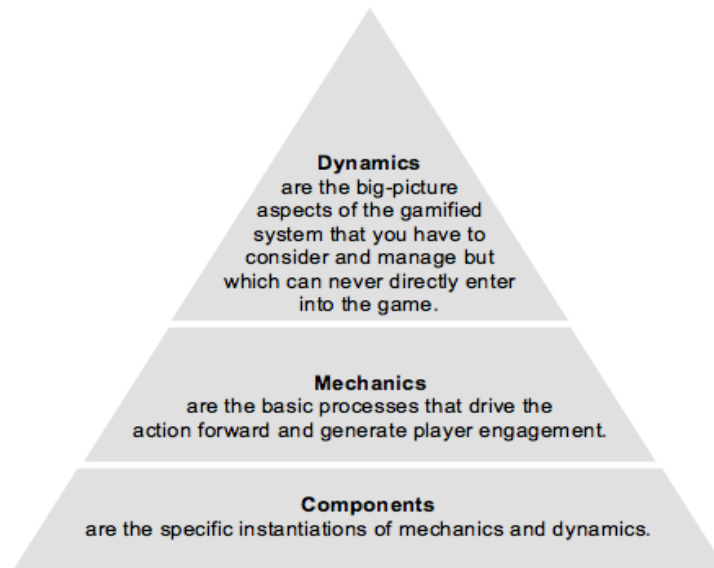
Note: Reprinted from (Werbach & Hunter, 2012, p. 82)

A. Game mechanics

All the needed components to play a game are referred to as mechanics where the game system is depicted (LeBlanc, 2006). They are actions, behaviours and control mechanisms that underline the gamified process, whereas the dynamics are the resulting desires and motivations (Bunchball, 2010, and KIm, 2015,p18). These game mechanic take the form of rules, venue, turn taking or the roll and move of a dice game for example. The most comonly used mechanics are rules, challenges, points, badges, levels and leaderboards (Healey, 2019). These mechanics generate feellings of competition, achievement, winning, losing which are known as game dynamics.

B. Game dynamics

These are game elements; that generate an aesthetic experience. They tackle the interaction between the player and the game mechanic (Kim, 2015). An example of game dynamic would be time pressure or yellow and red cards in football. The game dynamics generally generate behaviour or a feeling within the game, like winning or losing. (LeBlanc, 2006) refers to dynamics as the events or phenomena that might take place in a game. According to him, dynamics emerge from mechanics; taking for an example the act of winning is a result of the number of points collected in a period. Dynamics are the predictable actions and or behaviours that result from the interaction of game mechanics. Gamification permits an experience that drives behaviour and satisfies human basic needs and desires like the need for self-satisfaction, reward, achievement, status, altruism, competition and self-expression (Bunchball, 2010). In the design of gamified experience, there are couple of principles to be taken into account; where each principle affects the game mechanics or dynamics employed. (Detering, et al., 2011) develops the table below and it shows a taxonomy for game design principles:

Figure 1.2:

A Taxonomy of game design elements

Level	Description	Example
Game interface design patterns	Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implementations	Badge, leaderboard, level
Game design patterns and mechanics	Commonly reoccurring parts of the design of a game that concern gameplay	Time constraint, limited resources, turns
Game design principles and heuristics	Evaluative guidelines to approach a design problem or analyze a given design solution	Enduring play, clear goals, variety of game styles
Game models	Conceptual models of the components of games or game experience	MDA; challenge, fantasy, curiosity; game design atoms; CEGE
Game design methods	Game design-specific practices and processes	Playtesting, playcentric design, value conscious game design

Note: as cited in (Deterding et, al 2011, p.12)

For the sake of our study, we refer to the following game elements in an education setting:

1) Rules & constraints

Game players are guided by rules that instruct their actions and performance in a game; "Rules are constraints that limit the actions a gamer can and cannot take" (Charsky, 2010, p. 183).

2) Points:

Points are measurements of the player's achievement in response to the invested time and efforts (KIm, 2015, p17). Points are used to generate a positive feeling, sine people like to earn.

3) Challenges

Players work alone or in collaboration towards a goal and challenge themselves to achieve it. Challenges take different forms; quests, countdown, tests, missions, obstacles, courses...etc. some quests and missions require individual efforts, others require the intervention of teammates or other collaborators (Park & Kim, 2019). The psychological need for accomplishment urges the player to invest time and energy in order to overcome the confronted physical and abstract blocks or obstacles.

Winning against challenges, earns the player accumulated points, which result in getting a reward, badge or trophy and eventually unlocking levels. "A game does not always need to involve conflict, but there does have to be some sort of goal, and the attainment of that goal must involve at least some challenge" (Becker, 2017, p. 26).

4) Competition

Competition goes hand in hand with leaderboards and challenge. Individual players or teams with rivalry spirit compete against each other to be highly ranked. Players in indirect competition do not have to compete against other participants, they rather attempt to achieve a particular level, beat a previous score or overcome an obstacle. Direct competition however, requires players to outdo each other and be ranked high in the leaderboard. (Kim et al. 2018).

5) Leaderboard:

It is a board that shows the leading gamer's achievements; it includes the name, ranking, and the score of the gamers who are leading the game (Kim, et al, 2018, p. 76). In community games, players receive feedback on their position in the game compared to their peers or rivals. This pushes players to compete and out-do each other. Leaderboards are fuels for competition and are used in collaborative play (Kim, 2015). In gamification, leaderboards are used to drive valuable desired behaviour; it tracks and shows best or top performers in relation to the target behaviour (Bunchball, 2010). High-score table is a sample of leaderboard where the name and score are displayed.

6) Rewards

Rewards are tangible or intangible values given when the desired action or behaviour occur. Awards take the form of trophies, badges or merit card and are awarded after having successfully accomplished a level or overcome a difficulty. Taking for an example silver or golden card that are provided for frequent purchases or a shining badge posted publicly on one's social profile to show proficiency or expertise. Awards are given after -systematically- the completion of a task or challenge or on special occasion within the game, after a defined set of time spent in a mission or when the player or user moves to a more advanced status. The main purpose of the reward is to encourage behaviour and drive users to stay on a task. Paradoxically, awards like badges can be considered as extrinsic rewards that induce intrinsic motivation since they offer the quality of self-directed sustainable learning (Park & Kim, 2019).

7) Levels and progression:

This mechanic shows the advancement rate of a player in one level or within all the game levels. Levels take the form of progress bar, line or pie chart and numbers…etc. The player knows if he has reached the goal or he is close. Based on the number of points or currency he has collected. Levels differ in terms of complexity; the games increase in difficulty from a level to the other. They also function as a reward mechanism, it is relatively akin to the badge system. Unlocking a level means the player has the power, the ability or the skills to proceed in a more complex or challenging level. Levels keep the player in urge for more challenges i.e more levels. If the learning process is transformed into levels –instead of units- learners would be more interested in levelling up and unlock learning challenges; as stated by Kim (2015) "…tracking your progress is more fun if it feels like a game" (p. 17).

8) Feedback:

Constant, timely and continuous feedback impacts the overall cognitive and psychological behaviour of the learner. Being it positive or negative, it provides information about 'value, effect, or result of an action or process' vis-à-vis stimuli. Judy Willis explains more about feedback from a neurological point of view: "…brain responds with increased attention to feedback about the accuracy of predictions/choices it makes. Further, through a dopamine-prediction reward circuit, this feedback results in increased memory consolidation." (Willis, 2011, p. 264). Receiving feedback shows that learning is taking place, whereby the learner makes advanced trials in more challenging attempts (Feinstein, 2011). Arguable, feedback is an essential component in a gamified content for it provides simultaneous guidance, immersion and interest about the correctness of the player's actions (Goethe, 2019).

The above-mentioned game features are used to motivate learners to keep on doing the learning task and complete it; "the more learning activities they complete the more entertainment they receive" (Charsky, 2010, p. 178). Basically, serious games do share some of these elements, yet with less occurrence and emphasis. Both traditional and digital games apply the point system; the learner may get stars, points, currencies or badges for a completion of a task rather than classical grades. This system is known as pontification or incentivization and it is overly used in gamification than in serious games, which generated criticism by scholars. To sum up, in an attempt to mold the understanding of gamification (Krath, Schürmann , & Korflesch, 2021) identified ten principles to gamification such as: clear and relevant goals, individual goals, immediate feedback, social comparison, positive reinforcement, guided paths, social norming, adaptive feedback, multiple choices and a simplified user experience (p.13).

VI.   GAMIFICATION AS A TEACHING /LEARNING TOOL

Gamification has roots that predate its concrete application in education. (Detering et al., 2011) define gamification as the utilization of game elements in non-game contexts. This is to boost users' performance, behaviour , and engagement. Gamification as a term first appeared in the 2000s and was initially used in industry (Groh, 2012). Gamification is not new in education, as games and their underlying features that exist in gamification have already been used to engage learners in the learning process (Becker & Nicholson, 2016).

Unlike GBL, which is a playful activity with an educational purpose, gamification is characterized more by its incentive systems. Playfulness has long been introduced into the learning environment to foster learners' cognitive, behavioural, affective, and sociocultural engagement (Plass, Homer, & Kinzer, 2015). Play is the primary element in both gamification

and game-based learning. Moreover, the use of games has been called for in the teaching environment for centuries. Learning becomes effective when it is active, problem-based, experiential, and provides immediate feedback (Connolly et al., 2012), and these features are guaranteed by games, whether traditional or digital.

Parents openly express their concerns about their children's attachment – not to mention addiction – to technology and video games (Lieberoth & Fiskaali, 2021). Nonetheless, studies show optimism regarding the benefits of fun on children's behaviour and performance and the video game industry has capitalized on these virtues by designing games that resonate with players' mind-sets (Chaarani, et al., 2022). Accordingly, researchers urge educational stakeholders and policymakers to reconsider teaching and learning methodologies that responds to learners' needs and technological mind-set, emphasizing the need for curriculum revamping.

As explained above, gamification is integrated into education in a hybrid manner. In order to elicit a different outcome from the learner, teachers design a learning environment characterized by game mechanics that foster motivation and positive outcomes. Else, gamification in education might actually be a disguised game where learners are engaged in learning without realizing they are playing a game. Kim et al. (2018, p. 5) refer to this point by stating that "gamification is not just designed for learner fun and enjoyment." It is also an instructional approach that can be used to enhance the effectiveness of instruction on student learning. A gamified instruction does not necessarily require the absolute use of a game because it is not identical to educational games. The latter are full-fledged games, while the former is only a lightweight application that incorporates game elements into the learning context (Kim, 2015, p. 29).

1. The Algerian Context

Teachers' communities in Algeria are encouraged to utilize all the technological resources available in their teaching environments to ensure successful learning outcomes. That is to say; data projectors, audio devices, and videos, whether online or offline. Yet, the Algerian educational context is still labeled as non-digital (Sarnou, 2020) due to institutions that have not fully embraced up-to-date technologies. Learners, on the other hand, express discontent regarding the traditional teaching methodologies they receive in addition to challenges that hinder the success of 21st-century teaching in Algeria such as economic resources, including technological tools, appropriate infrastructure, and human resources such as training and educational materials (Labed, 2021).

In a comparative study conducted in Algeria on informal French language learning using gamified and non-gamified mobile applications - Duolingo and Mosalingua, respectively - it has been proven that gamification elements have the potential to enhance users' performance in learning the French language. The gamification techniques employed by Duolingo could ensure highly engaged users, leading to more time spent on the application and ultimately better learning outcomes. This is due to its playful game elements such as levels, progression bars, collections, and points. (Medjahed & Taib Benabbes, 2021).

Gamifying linguistics courses at the university level in Algeria was another attempt to create a student-centered environment through gamification in a non-digital context. Students implemented a variety of game design techniques despite gaps in technological resources and internet connectivity (Labed, 2021).

2. Current Educational Context: Needs and Challenges

Engaging in learning through games not only imparts information but also enhances the learning environment with an element of entertainment. Conventional schooling disrupts learners from the scope of learning. Gameplay, however, generates a positive effect and outcome during the delivery of information, where learners' focus is subtly directed towards an objective in a gameful atmosphere (Dicheva et al. 2015).

In a similar vein, revamping education to fit the 21st-century mold is a serious challenge that stakeholders must face and overcome in order to ensure a relatively successful gamification-based education that aligns with current trends (Landers et al. 2015). Hence, blindly adopting gamification would be a risky adventure due to the shortage of research and practice. Quite simply, we do not have a complete understanding of when gamification is an appropriate instructional tool and when it is not. "We do not know what aspects of human cognition and behaviour it is capable of changing and what might be changed unintentionally when used" (Landers, Bauer, Callan, & Armstrong, 2015, p.166).

There is a wide range of serious games designed for learning, such as "Stop Disasters" developed by the United Nations Office for Disaster Risk Reduction, "Dragon Box Elements," "Pulse," "Pacific," "Civilization," and "Minecraft." These games could also be used in language learning since they include communication and pair or group collaborative work (Healey, 2019). In a study on video game-based pedagogy using Statecraft X™, Chee (2016) found that neither teachers nor students demonstrated resilience towards the new instructional method. On one hand, students were uncomfortable because they were accustomed to direct instruction through textbooks. On the other hand, teachers expressed their concerns about the learners' final outcomes, ensuring the timely completion of the prescribed content under supervision.

3. Critics of Gamification in Education

Any movement or approach must undergo experimental evaluations before adoption; therefore, they have pros and cons. Despite tremendous findings on the impact of gamification on learning-related behaviour, little has been done to determine which type or aspect of gamification is more impactful and effective.

Countless efforts and resources have been dedicated to designing instructional technologies, and studies have focused on the learners' reactions and interactions with these technologies. However, methodologies for evaluating and assessing those technologies are scarce (Becker, 2017). Gamification cannot be effective unless it ensures both learner engagement and positive achievement. Else, learners are demonstrative and show willingness to perform tasks when they receive incentives. However, excessive use of the latter results in an undesired outcome. According to Deci, Koestner, & Ryan (2001), "Although tangible rewards may control immediate behaviour, they have negative consequences for subsequent interest, persistence, and preference for challenge, especially for children" (p.10). The negative impact of the reward system in gamification, whether it is a grade or points, can result in reduced performance when the reward system is decreased or eliminated (as cited in Healey, 2019, p.6). Hence, incentivization must be well studied before applying it to any particular task because adding a leaderboard and a point system to a problem does not fix the problem; it is not a miracle cure. According to Plass, Mayer, & Homer (2020) "Game-based learning is more than just adding points and gold coins to a typical set of math problems" (p.388). Thus, this process needs to be approached intelligently and with thorough preparation. When rushed and not well-designed, any application is destined to fail. No amount of points scored can change that (Christians, 2018). Furthermore, when users or players are continuously exposed to incentives and feedback, the pleasure hormone dopamine is released. The brain becomes accustomed to

these simulations, leading to a normalization of dopamine levels. Consequently, more effort and incentives from the teacher are needed to revive learners' motivation and engagement.

From an economic point of view, gamification is used to promote low-quality products or services, enticing customers with the assumption that the product will provide additional benefits. According to Bogost (2014) "gamification is bullshit" (p.68); as it is an optional choice that adds little or nothing to the business. Additionally Christians (2018) believes that it is "popular as a type of buzzword that excites business executives who do not understand it" (Christians, 2018, p.19). As per the reward system that characterises gamification such as points, gifts or stars; are superficial and they are from Bogost's (2012) perspective, simply 'pointsification' and exploitationware which means an excess use of points as a means of exploitation and manipulation (as cited in Becker & Nicholson, 2016, p.64).

On the professional level, it is considered unethical to deceive employees into performing beyond their expected duties; it is seen as a form of manipulation and control for the sake of profit (Goethe, 2019). In the same vein, with the release of the Sesame Credit app, the Chinese government could manage public opinion about the state. Those who publicly post positive opinions about the state will score high and have better administrative facilities, such as streamlined paperwork or faster passport acquisition. The extreme drawback of this app is that it bans users from employment opportunities if they share posts related to sensitive matters or show disobedience (Christians, Spring 2018). Adding to that, the successful implementation of gamification in any organization is questionable if the tracking metrics for employee behaviour are not thoroughly researched (Prakash & Rao, 2015).

A cohort of studies challenges the notion that gamification influences learning outcomes, instead emphasizing learning behaviour or attitudes (Landers, R. N., 2015).

According to Bartle, effective learning is not necessarily dependent on traditional gamification elements like badges and leaderboards; games alone can offer a high-quality learning experience (cited in Farber, 2017, p. 199). Additionally, excessive gaming can lead to an increase in dopamine levels, resulting in more joyful and motivating experiences. However, it may not improve academic performance (Feinstein, 2011). Another meta-analysis study demonstrates that extrinsic rewards integrated into the school environment, such as prizes, gifts, and tokens, can undermine intrinsic motivation. Else, extrinsic reward-based motivation is considered low quality (Ryan & Deci, January 2000). When learners are excessively rewarded with tangible rewards, they may become intrinsically less interested in learning and more driven by external incentives provided by educators for completing tasks or behaviours (Deci, Koestner, & Ryan, 2001; Carton, 1996; Goethe, 2019). "Although tangible rewards may control immediate behaviours, they have negative consequences for subsequent interest, persistence, and preference for challenge, especially for children" (Deci, Koestner, & Ryan, 2001, p. 10). In addition, feedback, if misused, especially in educational settings, may not lead to successful learning. Feedback and progress bars should be implemented and designed in a way that accurately reflects the correctness and completion of the assigned tasks. If the progress bar provides feedback on the time spent on task completion, learners may rush and struggle to concentrate on the task (Christians, 2018, p. 42).

Being a mainstream technique with widespread adoption in many fields, gamification is deemed to have a promising future despite its problems and shortcomings being disregarded (Goethe, 2019, p. 26). However, researchers do not consider it a "silver-bullet type of solution" (cited in Krath, Schürmann, & Korflesch, 2021). Else, few studies address the impact of specific game elements on behaviour, especially concerning learners' learning preferences (Legaki et al., 2020) and (Zaric et al., 2021), which could8 result in an unstructured gamification design.

Poor gamification can lead to users losing interest in the task at hand, especially when game mechanics such as points, badges, and leaderboards are excessively or ineffectively utilized; this is known as shallow gamification (Goethe, 2019, p. 28).

VII. GAMIFICATION REQUIREMENTS IN GAMIFICATION BASED PEDAGOGY

In a factual observation of the current education status, classrooms today are characterized by traditional top-down teacher/learner interaction, where students primarily engage through answering teacher's questions, completing assignments, and sometimes participating in limited cross-curricular activities. This setup often results in teacher dominance over learners' choices and decisions regarding the learning material. In addition to lower intellectual and literacy demands (Chee, 2016, p. 141).

The pedagogical system of gamification revolves around creating a game-based learning journey, where games are utilized to achieve specific learning goals or skills (Goethe, 2019). The application of gamified learning is not restricted to adding points and badges for the sake of motivation. Gamification should be meaningful by creating a connection between the learner and the subject matter; as argued by Becker and Nicholson (2016): "Meaningful Gamification is the concept of using elements from games to help participants find a personal and meaningful connection within a specific context" (p.62). It would be highly beneficial for teachers to immerse themselves in the gaming world in order to design suitable game-based or gamified lessons. He/she cannot know the aspirations of learners if he doesn't put himself in the learners' shoes; i.e., teachers have to explore the world of games and mimic the aspects that truly appeal to the learners in the classroom setting (Edtechreview, 2013). In a gamified environment, games

and their artifacts are considered by Pivec (2009) to "have a place in the classroom, but as a tool to be utilized by creative teachers and not to replace teachers" (p.4). Teachers are the designers and facilitators of the learning environment.

1. A Teacher or Game Designer?

The teacher or instructional designer does not empirically integrate games or game elements with the assumption that they will work perfectly; failure is a possible outcome (Edtechreview, 2013). Yet, doing it systematically would open the door to other trials and possibilities. The teacher might start with basic applications of gamification and gradually increase the complexity and intensity of the gamification elements.

According to Paul Gee, teaching is a design process that requires trial, reflection, and revision (Gee, What Video Games Have To Teach Us About Learning and Literacy, 2003). Good teachers design learning, reflect on it, iterate, and conduct alpha/beta testing to determine what worked and what hindered progress (Farber, 2017, p. 220). In gamification design, learners are considered customers of the product, i.e., the learning content. Educators need not employ elements of games randomly but rather conduct research to understand what truly captures the interest, motivation, and engagement of the target market – the learner (Goethe, 2019).

Game designers consider the user experience (UX) as the primary objective to achieve. When the teacher adjusts learning to fit the perspective of the learners, for example, by making it game-like, it becomes more engaging (Farber, 2017). Just like gamers, learners enjoy challenges, engagement, and adopt a competitive spirit to pursue knowledge, complete tasks, and gain the promised rewards, which keep them excited and enthusiastic about what comes next. All of the mentioned elements assure prolonged time and effort spent in learning (Goethe,

2019, p. 26). A pre-final step in the gamification design story is to inspect and look for feedback mainly from learners.

2. The Artifacts of Gamification in the Classroom

Gamification in education often involves attempts to wrap a game narrative around a course, topic, or project (Becker, 2021, p. 4). Successful language learning is not necessarily achieved by simply adding a few game elements; "The key lies in how gameful design (…) is incorporated into a lesson or a class" (Healey, 2019, p.7). Fortunately, a gamified learning environment is similar to the traditional one as both ensure effectiveness in terms of social skills such as listening, communication, and problem-solving, as well as improved learning motivation (Park & Kim, 2019).

To successfully apply gamification methods, it is necessary to know what technological means are available and the type of participants involved in the gamified process, as gamification features do not impact all participants equally. The element that works for one may not work for another (Bell, 2018). Meaningful gamification requires a clearly defined goal and a well-chosen set of reinforcers that influence desired behaviour.

3. Ways to Implement Gamification

In an attempt to understand the students' behaviour s and emotions in relation to the gamified experience, educators should replicate the learners' experience. In other words, acting as a player or learner allows the educator to become familiar with the game artifacts and design a lesson using the game elements that appropriately fit the learning objective (Kim, et al, 2018, p. 151). Moreover, teachers would be better off opting for a gamified system that appeals to them, since the success of gamification is unlikely to be achievable if the teacher is not

comfortable enough with the choice of the system (Bell, 2018, p. 151). Eventually, learners would comprehend it. In order to be able to properly gamify the classroom environment, consideration should be paid to the following:

- The content of the lesson

- The learning objective

- The type of instruction

- The desired behaviour or attitude to be achieved

Revamping a class into a gamified experience is not an easy winning venture. Hence, gamified-lesson designer should opt for simpler design techniques. In newly gamified experience, educators should consider less complex content and scope of learning, reduced number of learners, available technological resources and most importantly a careful selection of games mechanics (S. Kim, K. Song, B. Lockee, J. Burton, 2018). When adding the dynamic of competition into the gamified lesson along with other dynamics of kinship like leaderboards, achievement and badges, it is important to bear in mind the rival spirit of some 'killer' players. Consequently, participant in a community or collaborative play will compete against each other and eventually may create a feeling of jealousy and revenge in some extreme cases. Hence, competing against previous achievements can be a successful risk-free application; an example may include beating the previous scores (Christians, 2018). Furthermore, Park & Kim state that integrating stars, earnings and badges can be effectively used as learning traces (2019), which would eventually foster self-esteem and sustainability in learning.

VIII.   THE SIGNIFICANCE OF GAMIFICATION

It goes without saying that many attempts are made for the sake of improving a daunting task and turning it into a more interesting experience. Most often, gamification opens the door to more engaging experiences that meet the desired expectations.

1. Future Prospects and Opportunities

Despite Gartner's prediction of the disillusionment of gamification, the chances of it disappearing from the market technology are relatively low. One of the many reasons is that gamification enhances online community engagement projects due to the flexible features it offers (Bocska, 2012).

Inevitably, the world is undergoing constant and never-ending changes in a variety of fields. While innovative startups are in the process of development, gamification is present everywhere, even in standardized contexts. It stands out in the market for three main reasons. First, the traditional way of living and working seriously is no longer trendy and appealing; millennials are inclined to embrace and adapt to sophistication, fanciness, and convenience. Secondly, engagement is the number one key to the success or failure of many businesses; more engaged staff ensures better performance and relatively high productivity. Thirdly, fun and amusement are appealing and attractive to competitors (Zichermann & Linder, 2013) even Badges and medals are integral parts of the military promotion system, in addition to leaderboards which exist in sales, business, and school rankings (Becker & Nicholson, 2016).

Hence, it is worth embracing the mindset of gamification in order to fit into the 21ˢᵗ century mould. A century that is different in terms of objectives and means. For a better understanding

of gamification requirements, it is worthwhile referring to the milestones of 21st-century education compared to the precedent conventional style of education, as shown in (Table1.3).

Table 1.3:

The 20th century classroom and 21st century classroom

20th Century Classroom	21st Century Classroom
Time-based	Outcome based
Focus: memorisation of discrete facts	Focus: what students know, can do and are like after all the details are forgotten
	Active learning
	Learners work collaboratively
Passive learning	
Teacher-centered: Teacher is the center of attention and provider of information	Student-centered : teacher is a facilitator or coach
	Some freedom towards meeting common goals
Little to no student freedom	
	Integrated and interdisciplinary curriculum
Fragmented curriculum	
	Grades based on what was learned
Grades averaged	
	Grades can be cumulative based on performance
Numerical or letter grades scores over all work	

Typically one chance for assessment per task	May allow for resubmission, repeatable tasks
Teacher is judge. No one else sees student work	Self, peer and other assessments. Public audience, authentic assessments
Literacy is the 3 Rs- reading, writing and maths	Multiples literacies
Driven by the NCLB and standardized testing mania	Driven by exploration, creativity and 21st century skills.

Note: as Cited in (Becker & Nicholson, 2016)

According to Bell (2018), quantifiably measuring the success or failure of gamification may not be very helpful. Instead, it is more beneficial to examine the correlation between the level of gamification and the corresponding evaluation of learners' engagement and learning outcomes (Bell, 2018, p.154). Devedži developed values related to gamification, especially focusing on the use of badges in education. He pointed out values such as improved assessment, feedback, mainly grading, better instructional practices, and increased interschool collaboration and visibility (cited in Park & Kim, 2019).

2. The Affordance and Virtues of Gamification

Learning in a gamified environment has undeniable advantages. This includes overcoming shyness, increasing self-confidence, involving all students in the class, and

encouraging learners to undertake learning, discovery, thinking, and doing. This, in turn, enhances self-esteem and self-improvement (Cojocariua & Boghian, 2014). Collaboration, teamwork, and critical thinking are real-world skills that games like Lord of the Rings Online, Minecraft, and World of Warcraft can promote (Edtechreview, 2013). In addition, thanks to badges, learners can self-check their learning status and reach their goals by transforming invisible learning achievements into visible feedback or rewards.

Gamification has the power to enhance user experience by immersing users in a gamified system that engages and stimulates them (Goethe, 2019). In addition to increased engagement and motivation, learners benefit more from gamified learning on various levels. They can improve recall and retention, receive instant feedback on performance and progress, foster collaboration, catalyze behaviour al changes, and monitor progress (Kim et al., 2018) through the gamification tools available. Else, gamification has proven to induce significant psychological affordances in learning, affecting cognitive function, immersion, fun, engagement, and the encouragement of positive behaviour al change (Park & Kim, 2019). Cohort researchers categorize the outcomes of gaming and gamification in learning into affective motivational outcomes, behaviour al outcomes and cognitive outcomes.

C. Affective motivational outcomes:

Motivation addresses the motives behind human behaviour and answers the question of why a particular behaviour is manifested. Furthermore, there is a strong relationship between positive motivational outcomes and gamification and/or game-based learning, which enhances students' learning outcomes through high-quality intrinsic motivation (Krath et al., 2021). Other outcomes of gamified learning include satisfaction, immersion, flow, enjoyment, and a positive attitude (cited in Krath et al., 2021). Else, competition and the need to achieve push people to

adopt gamified learning. Gamification is effective because it taps into people's natural desires for competition and achievement. Teachers, managers, and other professionals use gamification to boost engagement and enhance productivity (Merriam-Webster, 2022).

D. Behavioural outcomes

As explained above, affective and motivational aspects of gamification lead to behaviour al outcomes. In education, as in many other contexts, gamification enhances learners' motivation and ultimately promotes behaviour s such as engagement, participation, collaboration, teamwork, and improved performance (Krath, Schürmann, & Korflesch, 2021). These factors are key reasons why instructional designers widely embrace gamification. "Applying gamification to the product is likely to influence users' positive psychology, motivating them and increasing their engagement" (Goethe, 2019).

E. Cognitive outcomes:

Cognitive outcomes in an educational context are linked to learning outcomes and academic achievements. Learning outcomes are all the skills, competencies, and knowledge set by the educator to be acquired by the learner. Cambridge Cognition (2015), on the other hand, defines cognition as: "a range of mental processes relating to the acquisition, storage, manipulation, and retrieval of information" (Paragraph, 1). A good combination of affective and cognitive outcomes leads to improved academic performance (As cited in Krath et al., 2021).

These are qualities most associated with gamification, which has faced criticism due to some shortcomings, such as noise, content adaptation, and teacher control, among others. "It's

not possible to take a lousy process and sprinkle on some game elements and make it fantastic" (Goethe, 2019, p. 24).

Conclusion

The challenges that occur on a daily basis create the need for adaptation, and the same applies to education. As stated in the report "Gaming in Education," McClarty believes that "The rise of various '21st-century skills' taxonomies and frameworks highlight the growing discrepancy between current educational outcomes and the skill sets needed to succeed in the quickly shifting world" (McClarty, et al., June 2012).

If you were a teacher, you would definitely be happy to see that joyful smile on your learner's face when you stamp 'excellent' on her copybook. You won't miss the chance to give that slow learner a thumbs up or a round of applause for a mere correct answer. You continue to create challenges, competitions, and award badges and stars with full awareness that they do not result in an invention. That is the power of gamification for you and your learners.

The present chapter provided a general understanding of the emergence and application of gamification in various fields, with a particular focus on education. It first started with defining the related core concepts such as games, game-based learning, and gamification to provide the reader with a scrutinized idea about the fields and their milestones. Secondly, the author attempted to outline the development of gamification and its emergence as a stand-alone field. This would enable the reader to understand the history behind its spread and popularity. Thirdly, an explanation of the prominent theories that support the application of gamified systems and the proponents of these theories. After that, the author described all the elements that constitute a gamified system, including mechanics, dynamics, and aesthetic components of the system. This helps the reader to get a glimpse of the potential application and combination

of each element and the resulting outcome. Then, the author delved deeper into the usability and potential of gamification in education, exploring its requirements to provide concrete examples of gamified pedagogy. At the end of the chapter, the virtues, critiques, and future prospects of gamification were presented to assist the reader in critically forming a clear understanding of the trend and its potential.

Having understood the key concepts and terminologies interrelated in the area of educational gamification, the reader would be equipped to evaluate the application of gamification in EFL context and more particularly in vocabulary learning and retention in the coming chapter.

CHAPTER TWO: VOCABULARY LEARNING AND RETENTION

Introduction

Every parent eagerly anticipates their baby's first words. It is one of the key stages in human development. Words have a life of their own; vocabulary needs constant fertilizing, otherwise, it would die. For fluent communication in English, one must invest in expanding their vocabulary as much as possible. The English language comprises approximately 600,000 words, as documented in the Oxford English Dictionary (1989). However, when taking into account entries from other dictionaries, this number could potentially increase to 750,000 words (Jackson & Ze´ Amvela, 2007, p. 52). A native English speaker would use around 50,000 words in their daily communication. A more astonishing fact is that Winston Churchill, a politician and a man of war, is famous for his extensive vocabulary, which consisted of around 60,000 words. Vocabulary acquisition and learning are crucial components of one's personality. This chapter is dedicated to vocabulary for a specific reason.

The present addresses tackles fundamental core aspects of acquisition. learning. Firstly, the author starts by providing definitions of the main recurrent vocabulary-related concepts to clarify and differentiate terminologies. Second, a more detailed explanation is needed regarding the process of vocabulary learning. This will acquaint the reader with notions, techniques, and mechanisms related to the learnability of vocabulary. Afterwards, difficulties are outlined to make the reader aware of the obstacles they may face during their pursuit of language learning. When technology-assisted learning is incorporated as one of the various techniques in language learning, the reader will become acquainted with all aspects of vocabulary learning through ICTs. After that, the author discusses vocabulary retention as the primary objective of any

language learner. This section delves into the cognitive aspects of vocabulary acquisition and addresses the reader's questions regarding how long a word can be retained. In relation to learning and teaching vocabulary, Bloom's taxonomy is referenced to illuminate the stages of language learning. Moreover, vocabulary processing is examined through the lens of Bloom's taxonomy. Lastly, the author discusses Bloom's taxonomy with a focus on gamification. Hence, the reader will be able to gain a clear understanding of the contribution of Bloom's taxonomy in the process of digital vocabulary learning. According to Zimmerman (1997:5), "Vocabulary is central to language and of critical importance to the typical language learner" as cited in Kebiel (2012, p. 17).

I. DEFINITION OF VOCABULARY

In order for a human being to communicate with oneself or with a third party, it is necessary to use words that convey meaning for a desired idea or message. Therefore, vocabulary acts as the vessel that carries the message across the communication channels. Any type of vocal utterance that conveys meaning and is used for communicative purposes would be considered vocabulary or lexis. For a more advanced understanding of the different terms, the author provides below some of the most relevant definitions of vocabulary, lexis, and word.

1. **Lexicology**

Lexicology, as a branch of linguistics, deals with the study of the meaning and usage of words (Merriam-Webster, 2022). More particularly, it deals with the study of the set of words comprising the lexicon of a given language at a specific time and it encompasses three subsequent branches: semantics, morphology, and etymology (Jackson & Ze´ Amvela, 2007). Lexicology originates from the Greek language; "lexico" meaning word and "logia" which means study, and it was first used circa 1828. McArthur (1992) defines Lexicology as the study

of word elements, their nature, meaning, and history (cited in Jackson & Ze´ Amvela, 2007, p.3). It leads to an understanding of linguistic structures, their functioning, role, and evolution.

2. Vocabulary

Ironically, according to English grammar rules, the word "vocabulary" is considered an uncountable noun, even though it encompasses an almost infinite set of words. In this respect, the online English language dictionary Merriam-Webster (2022) defines "vocabulary" as a "list or collection of words or of words and phrases usually alphabetically arranged and explained or defined". Indeed, Richard and Schmidt (2002) define vocabulary as a collection of lexemes that encompass single words, compound words, and idioms. According to Jackson and Ze´ Amvela (2007), the terms vocabulary, lexis, and lexicon are synonymous, referring to the word stock of a given language. Hence, a meaningful combination of alphabets conveying a message is known as vocabulary.

Surprisingly, individuals are not capable of embracing all the lexicon of a given language, not even a native speaker. The latter uses around 5,000 words in daily speech. The English language comprises around 500,000 words (McCarthy & O'Dell, 1994). English is considered a rich language due to the fact that the territory of England has been inhabited by many civilizations. We can distinguish four types of vocabulary: high-frequency words, low-frequency words, academic words, and technical words (Nation I. , 2001).

3. Morphology

The morpheme is the minute or infinitesimal unit of a word (Jackson & Ze´ Amvela, 2007). A word may consist of a number of meaningful units. For example, the word 'teachers' consists of three morphemes (-teach, -er, -s). Morphology, therefore, studies the arrangement

and distinction of morphemes in the construction of words (Jackson & Ze´ Amvela, 2007). Morphological analysis of word parts is an integral aspect of lexicology and contributes to an understanding of semantics. Lexis, being a predominant feature in acquiring a language, creates a feeling of frustration among learners when lacking, as they struggle to effectively convey their ideas in spoken or written forms. (Caro & Mendinueta, 2017).

4. Word

A word is a complex of phonological, morphological, syntactic, semantic/pragmatic, and associational features (Laufer, 1991, p. 82). Understanding a word requires familiarity with its form, structure, syntactic behavior, meaning, and lexical behaviors (Laufer, 1991, p. 83). Moreover, Jackson & Ze´ Amvela, (2007) define the concept 'word' based on different perspectives; since a word may take different definitions depending on its occurrence, according to them, a word is "an uninterruptible unit of structure consisting of one or more morphemes and which typically occurs in the structure of phrases" (p. 59). Bloomfield (1933), however, considers a "word" as a minimal free form that can occur in isolation and have meaning.

Little interest or consideration has been given to the study of vocabulary learning and acquisition. It only gained more importance by the late 1970s (Carter & McCarthy, 2013; Xu, 2014; Gairns & Redman, 1986; Chacón-Beltrán et al., 2010). Instead of grammar being seen as a closed and manageable system, it has been the core interest of learners, teachers, and course designers. They believe that vocabulary will be acquired implicitly within grammatical structures when learners are repeatedly exposed to the target language (Chacón-Beltrán et al., 2010, p. 1). It is advisable to closely examine the processing of vocabulary, considering both the cognitive and psychological aspects of vocabulary learning.

II.   VOCABULARY LEARNING PROCESS

Learning languages is as vital as mastering one's mother tongue because the globalized world requires and promotes diverse means of communication, channels, and languages.

Grouping vocabulary in a coherent manner and presenting it to learners is challenging to teachers and to learners. This is due to limited time availability, conflicting student interests, and additional demands imposed by other syllabi (Rosyada & Apoko, 2023). Further, incidentally learned vocabulary cannot be trusted to encompass the lexicon required by learners for their eventual use. Hence, teachers should make a prudent selection of the vocabulary needed by learners, focusing more on high-priority items and providing varied practice opportunities. Gairns & Redman (1986) highlighted the role of vocabulary in language learning stating that: "Vocabulary is arguably the foundation of mastering a language because it comprises the building blocks of meaning"(p.1).

Extensive vocabulary is the key to communicating successfully and can make speaking, listening, reading, and writing smoother and more situationally precise (Webb & Nation, 2017). It is to mention that vocabulary learning is not simply about memorizing a list of words; it is a complex process. For example, the learning burden of acquiring second language (L2) vocabulary can stem from various sources, such as the linguistic structures of learners' first language (L1), the similarities between learners' L1 and L2, the methods used to teach vocabulary, and the learners' exposure to the words(Webb & Nation, 2017). Hence, L2 learners often struggle to learn and memorize vocabulary because lexical knowledge does not generalize easily (Yu & Trainin, 2022).

1. The Importance of Vocabulary Learning

Mastering a word is not only about knowing its meaning. It involves its grammatical characteristics, pronunciation, and word associations (McCarthy & O'Dell, 1994 and Xu, 2014). It is commonly agreed that mastering grammatical structure is challenging and important. However, accumulating the necessary amount of vocabulary is equally important as grammar in order to effectively communicate ideas (Nation, 2023). It is important to highlight that a large vocabulary is necessary to communicate effectively in various social and technical contexts, as well as to comprehend authentic materials like books, leaflets, and magazines (Schmitt, 2010). As per the importance of vocabulary, Wilkins (1972) emphasises that vocabulary is quite predominant in transmitting a message, compared to grammar: "Without grammar, very little can be conveyed, without vocabulary, nothing can be conveyed" (p.111).

Thanks to Paul Maera's observations in the 1980s, vocabulary regained its important status in language learning and acquisition. Later, in the 1990s, Paul Nation provided a systematic grounded approach to vocabulary learning and teaching based on the frequency and exposure of the vocabulary to be learned (González-Fernández & Schmitt, 2017, p. 281). According to Nation (2001, p. 47), knowing a word requires mastery of its form, meaning, and use. He adds that mastering all of the mentioned aspects is not easily achieved. Even advanced learners are not expected to understand all aspects of a word family, such as "philosophize, philosophical, philosophically," or its various meanings (cited in Schmitt, 2007, p. 749). Obviously, the learning of a word follows an incremental process; even spelling can be mastered at different rates (Schmitt, 2017). Learning a word is a complex endeavour that should be approached gradually, not all at once. This also implies that lexical knowledge necessitates repetition to fully comprehend all aspects of a word. Repetition refers to the number of exposures and/or usages of a word; some words are prominent and necessary for the learner to

acquire incidentally or intentionally (Schmitt, 2007, p. 749). According to him, it is important to consider the vocabulary memorization curve when setting a schedule for the recycling and repetition of words. Otherwise, the word is likely to be forgotten. An estimation conducted by Goulden, Nation, & Read (1990 p. 367) stated that an educated native speaker would typically master around 17,000-word units (as cited in Gu 2003, p. 271).

According to Schmitt (2007) explicit vocabulary teaching is time-consuming, so it must be beneficial, and the cost should ideally align with the desired outcome. If the targeted objective is around 10,000 words per family, then this is a utopian aim. Additionally, Schmitt (2007) argues that learner can effectively acquire around 2000-5000 words during classroom time and be able to successfully apply them receptively and/or productively. Moreover, the main task of the teacher should be to give explicit attention to the most frequent words and their aspects of meaning and grammar. Infrequent words such as "register" and collocations should be learned through extensive exposure (Schmitt, 2007, p. 751). Hence, the teacher's task is not restricted to spoon-feeding learners with bundles of vocabulary; rather, it is about monitoring learning and teaching learners how to learn. Learning about learning strategies is a life skill.

2. Strategies and Steps in Vocabulary Learning

Language learners agree that vocabulary learning is a daunting task, and like any other learning endeavour, it requires a strategy for effective and efficient learning to take place. According to (Schmitt, 1997), research attempts in language learning strategies began in the 1970s as beliefs evolved regarding how learners approached their language learning and language use, and the connection between language proficiency and learners' individual efforts in language learning.

A strategy, as defined by Rubin (1975, p. 43), is any technique or device used by a learner in the pursuit of language learning and acquisition (cited in Griffiths 2008, p. 83). A strategy, as defined by Longman Dictionary (2002), is "procedures used in learning, thinking, etc., which serve as a way of reaching a goal. Whereas in language learning, learning strategies are the conscious or unconscious processes that language learners utilize to learn and use a language" (p.515). Hence, Cognitive strategies, metacognitive strategies, social strategies, and resource management strategies fall under the umbrella of language learning strategies (Richards & Schmidt, 2002). A further definition of Language learning strategies by O'Malley and her colleagues (1985) is "any set of operations or steps used by a learner that will facilitate the acquisition, storage, retrieval, or use of information" (p. 23), or any physical or mental activities that learners consciously choose to regulate their own language learning (Griffiths,2008).

Additionally, a second language learning strategy is a behavior carried out with the aim of learning, and this behavior can be either intentional or potentially intentional (Richards & Schmidt, 2002). Particularly, vocabulary learning strategies are an integral part of language learning strategies, which belong to a category of learning strategies (Nation, 2013). In the same vein of thought, Dodigovic et al. (2020) refer to Vocabulary Learning Strategies (VLS) as "the procedures used by language learners to commit vocabulary to memory and learn how to use it more accurately or appropriately" (p. 78). However, Norman (1980, p. 97) argues that teachers play a crucial role in teaching students how to learn: "we expect students to learn yet seldom teach them about learning" (cited in Cajski, Spring 1999, p. 1). The focus of the teacher is mostly on teaching rather than on facilitating learning.

Learning strategies go through a cycle of choice, use, and evaluation, which are determined by the nature of the task, the type of learner, and the repertoire of strategies available

(Gu, 2003). Learners often favour mechanical strategies such as memorization, note-taking, and repetition over more complex ones that require more significant manipulation (Schmitt, 2007, p. 755). According to Nation, (2013) there are features typical to VLS, one of the prominent features is the effectiveness and the efficiency in vocabulary learning strategies along with features of choice, complexity and benefit. Learners should be taught how to choose a strategy based on these features.

Vocabulary learning should be strategic in order to be efficient, effective, and enjoyable (Gu, 2003). Learners should be proficient in applying Vocabulary Learning Strategies (VLS) because they are quite beneficial for both high and low-frequency words. Using VLS with infrequent words facilitates the task for learners to expand their vocabulary. Moreover, teachers often cannot dedicate classroom time to teach these infrequent words (Nation & Meara, 2010, p. 43) but can provide guidance on techniques for independent vocabulary learning (Schmitt, p. 755). Below Nation & Meara (2010) develop an explanation of four major strategies used to find and memorize the meaning of words:

- **Guessing From Context**

This strategy refers to one of the sources that provide information about an unknown word. In this approach, the learner infers the meaning and function of the word from its context (Nation, 2013, p. 327). This strategy is based on the assumption that word learning is a cumulative process that occurs through extensive reading. Learners need to know about 95% of the words in the text in order to decipher the meaning of unknown or unfamiliar words. A fruitful guessing depends on how good the learner is at reading and listening. Acquiring the ability to accurately guess a significant number of unfamiliar words is the outcome of extensive reading. Moreover, poor guessing skills cause interruptions in the reading process.

- **Learning from word cards**

It is a technique used when learners deliberately learn new words. This strategy involves a number of mnemonic techniques used in vocabulary learning, such as the keyword technique. Using pictures to learn words has proven to be an effective technique because it guarantees an understanding of a word without lengthy explanations. However, a picture may not necessarily aid in recalling the word; the learner might for -some reasons- come across the picture in future contexts but may not recall the associated word (As cited in Zwier & Boers, 2023, p. 217).

- **Utilizing Word Parts**

Similar to the previous strategy, the word part technique necessitates some familiarity with keywords. The word parts technique is widely recognized since it has been proven to be helpful when the learner masters around 20 affixes initially.

- **Using a dictionary**

It is the number one preference and refuge for foreign language learners. Dictionaries can be monolingual, bilingual, or multilingual. The latter includes words and definitions in the first and target languages. Most learners, especially beginners, often opt for bilingual dictionaries. Else, dictionaries proved to offer support for all four skills (listening, reading, speaking, and writing). Learners need training to effectively use the dictionary because it requires a variety of subskills such as phonemic transcription, grammatical information, formal and semantic relatedness of words, and more.

While the above vocabulary learning strategies help grow and enrich learners' vocabulary, it is equally important to include it in a context with associated nouns, adjectives, or prepositions, along with its grammatical structure and pronunciation, rather than in isolated

form. Some of these strategies are words associations, grammatical associations, diadrams and word maps (McCarthy & O'Dell, 1994).

Besides, classroom time should be devoted to teaching high-frequency words and instructing learners on techniques for approaching lower frequency words for self-learning (Schmitt, 2007). These VLS will lessen the burden on teachers who are constrained by time and syllabus completion, and they will be beneficial for learners who want to expand their vocabulary. Schmitt (2007) points to two strands of vocabulary learning: explicit word learning and incidental learning. The former involves mentorship from a teacher who introduces key aspects (meaning, form, and use) of the high-demand teachable material, while the latter is an incidental effort to reinforce those highly sought-after words alongside other less common new words. Incidental and intentional vocabulary learning are complementary in nature, yet they differ in that intentional learning is more focused and selective compared to incidental learning, which is random and occurs sporadically (Schmitt, 2010).

A. Incidental vocabulary learning strand:

Achieving more efficient incidental learning of a second language is possible by residing in a foreign country where the target language is the primary spoken language. If not, learners should be extensively exposed to the target language by maximizing its use in the classroom, learning in groups to share knowledge about new words, and speaking with a native or proficient speaker of the language (Newton, 2001; Schmitt, 2007). Incidental learning compensates for the lack of intentional learning by occurring implicitly while performing other language skills, such as reading. It addresses aspects of word knowledge that are not explicitly

covered and offers opportunities for recycling, consolidating, and enhancing learned items (Schmitt, 2010).

B. Intentional vocabulary learning

Learners and teachers are both concerned with the depth of vocabulary knowledge, and most tests are designed to measure its extent. Vocabulary learning strategies (VLS) more or less focus on how much vocabulary one knows; if a learner uses these VLS often, his language repertoire will be large enough to cover his communicative needs (Gu, 2003, p. 273). Intentional vocabulary learning often focuses more on the quantity rather than on competent or skillful use of this vocabulary.

Unlike incidental learning, which is slow and untargeted, intentional learning is timely, robust, and focused. The teacher, by making prior selections of the necessary vocabulary, facilitates faster learning, better engagement, and improved retention (Schmitt, 2010).

3. Taxonomies of Vocabulary Learning Strategies

The 1970s was the threshold of the development of classification in the arena of language learning, thanks to Rubin and Stern. These classifications include an extensive list of techniques for language learning, starting with O'Malley's classification in 1985, followed by Rubin's in 1987, Oxford's in the 1990s, and then Stern's in 1992 (Kebiel, 2012). Attempts to make language learning more successful and strategic led researchers to consider a more sophisticated and specific objective: vocabulary learning strategies. (Nation I. , 2013) provided a taxonomy of four categories of VLS, namely:

➢ Planning vocabulary learning: the strategies of this category include choosing which word to learn (frequent or infrequent words or general, academic or technical words) choice of which word aspect to learn (form, meaning or use), choosing the most relevant strategy amongst others and last planning repetition for retrieval and recycling learned words.

➢ Sources to find information about a word

➢ Processes: establishing vocabulary knowledge

➢ Skill in use: enriching knowledge

One of the most widely adopted taxonomies is Schmitt's 1997 taxonomy. It is an adaptation of Oxford's 1190 classification and is widely recognized for containing a comprehensive list of techniques categorized into five major groups: social, memory, cognitive, metacognitive, and determination strategies, as explained in the table below:

Table 2.1:

Schmitt's Taxonomy of Vocabulary Learning Strategies

Strategy type	Definition	Example technique
Determination Strategy	Strategies to discover new words without referring to another's expertise.	Analyse part of speech Analyse pictures or gestures Use of dictionary Guessing from context Word list Flashcards
Social Strategies	Use of social interaction with people to improve language	Ask the teacher or classmate for translation or meaning. Join a social group for communication Talk to a native speaker

Memory strategies	Or mnemonic strategies. Laking connection between new words and previous learning.	Word association with synonym or antonym Semantic map Keyword method
Cognitive strategies	Manipulation or transformation of information about words	Vocabulary notebook Spoken and written repetition Put labels of physical objects
Metacognitive strategies	Decision making about planning, monitoring and evaluating learning	Use spaced word practice (expanding rehearsal) Test oneself with word tests Continue to study word over time

Reprinted from: (Schmitt, Vocabulary Learning Strategies, 1997, pp. 207-208)

The aforementioned strategies are quite useful as they create autonomous learners who are responsible for their own learning and help learners acquire more vocabulary compared to those who don't use VLS (Nation, 2001). Strategic learners who can determine the importance and difficulty of tasks are able to choose, use, and evaluate strategic learning cycles (Gu, 2003). In his view, learning strategically has many benefits, for instance:

➢ Directing learner's attention and focus to the mostly needed vocabulary instead of a random vocabulary learning.

➢ Helping learners find and invest vocabulary in the right time and place

➢ Determining the which VLS appropriate for which type of vocabulary

➢ Evaluating the usefulness and suitability of strategies and shift among strategies in a flexible way.

Furthermore, the selection of an appropriate strategy to transfer word knowledge to learners is also a major concern to teacher while teaching vocabulary. The word "*bird*" for

instance, can be understood through a picture rather than a definition. The learner would grasp the meaning of the verb "*fly*" through a simple gesture, whereas abstract words like "cheat" need to be defined or explained in a situational context. (Schmitt, 2010) highlights vocabulary teaching techniques such as gestures, definitions, examples, synonyms, antonyms, and applying them in a situational context. These methods help learners quickly grasp a word. Moreover, it is important to take into consideration the learners' styles and the approaches that best fit the learners.

III.   Learning Vocabulary and the four skills

When confronted with a large amount of vocabulary and word families, learners often become confused and contemplative about which vocabulary to learn or prioritize first. For this purpose, it is important to consider the learners' needs and the usefulness of the vocabulary (Nation & Meara, 2010). Numerous research attempts have been made to estimate the number of words required for reading and listening comprehension, as well as for productive skills in speaking and writing. The majority of the conducted research has focused on calculating the correlation between test scores for general vocabulary knowledge and scores on the four productive tests. Estimation results on the number of words required vary but show a strong association between vocabulary knowledge and efficiency in the four skills. Therefore, there is a need for expanding vocabulary to enhance comprehension and communication.

In the 1930s, Ogden and Richards made an endeavour to minimize vocabulary learning lists for foreign language learners to 850 words and simplify the rules to the simplest usage possible to facilitate language learning (Carter & McCarthy, 2013). In a similar vein, many other attempts were made, including the widely recognized 'General Service List' by Michael

West and Harold Palmer in 1953. The list consisted of 2000 words selected based on criteria such as frequency (high or low), semantic behavior, universality, and utility (Carter & McCarthy, 2013, p. 7; Nation & Meara, 2010; Hirsh & Nation, 1992). According to Hirsh and Nation (1992), the list of 2000 frequent words is insufficient to meet the reading needs of learners. Instead, they argued that there should be coverage of 5000 word families.

Accordingly, both learners and teachers should pay more attention to high-frequency words that occur frequently and are intentionally taught by teachers. In addition, there are four types of vocabulary identified by Nation (2001): high-frequency and low-frequency words, academic words, and technical words. It is important to note that academic and technical vocabulary also includes specialized terms that should be mastered in addition to common words. High-frequency words refer to technical or specialized vocabulary, which "consists of vocabulary that is very closely related to a particular subject area" (Nation & Meara, 2010, p. 37). Yet, infrequent words of less occurrence should not be disregarded; learners are encouraged to make incidental or deliberate efforts to acquire them through techniques or vocabulary learning strategies intentionally suggested by teachers, such as guessing, word parts, and dictionaries, etc (Nation & Meara, 2010).

Furthermore, a strong command of vocabulary, encompassing pronunciation, spelling, morphology, and understanding word meanings in different contexts, is crucial for developing a rich vocabulary. This proficiency contributes significantly to improving the four language skills: listening, reading, speaking, and writing (Hao, Wang, & Ardasheva, 2021). Schmitt (2010) distinguishes four alternatives to the terms receptive and productive skills, including meaning recognition and form recognition, as well as meaning recall and form recall (As cited in Nation, 2013, p.222). Word knowledge requires a distinction between the way it is received and produced; that is, being able to recognize its form and meaning when heard or read in order

to eventually use both the word form and meaning appropriately. Nation (2013) scrutinizes the aspects of form, meaning, and use of a word in a detailed table explaining what aspects should we need to know or learn a word. (See table 2.2)

Table 2.2:

What is involved in knowing a word.

Form	Spoken	R	What does the word sound like?
		P	How is the word pronounced
	Written	R	What does the word look like?
		P	How is the word spelled or written?
	Word parts	R	What parts are recognisable in this word?
		P	What words parts are needed to express meaning?
Meaning	Form and meaning	R	What meaning does this word form signal?
	Concepts and referents	P	What word form can be used to express this meaning?
	Associations	R	What is included in the concept?
		P	What items can the concept refer to?
		R	What other words does this word make us think of?
		P	What other words could we use instead of this one?
Use	Grammatical Functions	R	In what patterns does the word occur?
	Collocations	P	In what patterns must we use this word?
		R	What words or type of words occur with this one?
		P	What words or types of words must we use with this one?
R: receptive knowledge, P: productive knowledge			

Note: As cited in (Nation I. , 2013, p. 49)*.*

It is arguably easier to learn a word receptively than productively, and the same applies to receptive and productive testing (Stoddard, 1929; Griffin, 1992). Therefore, according to this assumption, training in vocabulary testing is as crucial as training in vocabulary teaching. Furthermore, teachers should be knowledgeable and well-equipped with a rich vocabulary to effectively teach and assess students' vocabulary knowledge. Below is an explanation of vocabulary knowledge in relation to the four skills.

1. Reading:

Vocabulary knowledge is closely linked to reading. Even learners with a larger vocabulary experience higher enjoyment and stamina compared to learners who have mastered less vocabulary (Cited in Kingsley & Grabner-Hagen, 2017). In a leisurely reading session, a reader would need to be familiar with approximately 5000 words (tokens) to comprehend 95%-98% of an un-simplified text like a novel (Hirsh & Nation, 1992). Otherwise, the reading experience won't be enjoyable. Scholars like Schmitt (2007) emphasize the importance of having a vocabulary threshold of 3,000 words to read authentic texts (Schmitt, 2007). This collection of words will help the reader understand the meaning of unfamiliar words based on the overall context.

Hirsh & Nation (1992) suggested three solutions that enable learners to read complex texts with ease: pre-teaching and pre-learning vocabulary, simplifying the text at hand, and/or conducting an intensive study of the complex text, i.e., explaining each difficult word (Hirsh & Nation, 1992). The latter might be time-consuming and lead to boredom. The feasibility of these techniques depends on the learner and the text at hand. The richness of the English language makes it difficult to select which words belong in the 3000-word list. Therefore, the list is

determined by the reading goals of the foreign language learner, whether they require the language for general communication or for specific academic or technical purposes. Moreover, the list of words to be acquired by learners contains high-frequency words. So, it is crucial for second language learners to learn high-frequency words because they form the foundational vocabulary necessary for all language use. Words of common functionality are considered general-purpose vocabulary. Moreover, reading is traditionally considered an effective method to increase exposure to a foreign language (Schmitt, 2007).

2. Listening

Fundamental to the goal of language proficiency is the mastery of listening skills for vocabulary gain. It is important to recognize the meaning and form of a word when heard in order to construct knowledge. Hence, listening skill is of great import whereby learners seek ways to develop their listening along with other communicative skills. The ability to transfer oral messages in communication, good listeners of language would do so with ease; as argued by (Zhang & Graham, 2019), the oral input in central to vocabulary acquisition in communicative language teaching. Additionally, an intensive exposure to aural input highly contributes to the enhancement of vocabulary knowledge, yet it is often overlooked by language learners and teachers (Cohen, 2008). In the same vein, Nation (1990) puts in a number of activities to improve vocabulary acquisition through listening, such as loud reading, glossing new words and dictation (As cited in Shulman, 1987, p. 156).

3. Speaking

The spoken form of a word refers to the learner's ability to pronounce it, considering stress, intonation and other phonological and phonetic representations. As Shulman (1987) argue; acquiring lexis through listening and speaking is easier as verbal skills compared to

reading and writing. Additionally, interaction is important to stimulate communicative practice. Speaking skills for instance, can be mastered through a number of activities like pair-work or paraphrasing where participants negotiate and explain vocabulary through the use of the already known words (Shulman, 1987).

4. Writing

Everyone envies a spelling bee winner for their remarkable skill in recognizing the written form of a word. Inadequate spelling can negatively affect writing, which pushes the writer to use familiar words (Nation, 2013). Therefore, having a good vocabulary reduces the challenge of selecting the appropriate word in its proper form.

IV. DIFFICULTIES OF VOCABULARY LEARNING

It is an agreed fact among second language speakers that building vocabulary tends to be an overwhelming task due to the amount of vocabulary to grasp, as well as the aspects of word knowledge, including spelling, meaning, and usage (Zwier & Boers, 2023, p. 13). According to Thornbury (2004), there are factors that make vocabulary learning a challenging task, such as pronunciation, spelling, length, complexity, grammar, meaning, range, connotation, and idiomatic expressions (As cited in, Rohmatillah, 2014, p.11).

Research in vocabulary acquisition and learning mostly deals with memorization, word difficulty, and interlanguage (Carter & McCarthy, 2013). In the same line of thought, Schmitt (2010) identifies six core issues that most learners and teachers encounter and must overcome during the process of vocabulary learning and teaching. These issues include the number and type of word families to be acquired, the incremental nature of vocabulary acquisition, the need

for consolidation and enhancement, and finally, the pedagogy of vocabulary in the classroom (Schmitt, 2010, p. 28). Furthermore, difficulties occur at different levels listed below according to (Zwier & Boers, 2023, p. 13-14):

- Spelling and pronunciation.

- Interference from the mother tongue may hinder the meaning of the original word (taking the example of false friends / les faux amis in French/English languages).

- Polysemy (words that have multiple meanings).

- Grammatical features (countable/uncountable nouns).

- Awareness of use restrictions (case of slang or offensive words).

- Collocations and idioms as well as familiarity with borrowed or loanwords and coinages.

- Exclamations (euh/ bah…) and proverbs – word partnerships eg. to conduct research (Zwier & Boers, 2023, p. 13-14)

Additionally, time is one of the major factors that hinder the successful learning of vocabulary. The time spent instructing the target vocabulary is limited, as is the time of exposure to the target language outside the classroom. This limitation will eventually lead to a poor vocabulary (Hao, Wang, & Ardasheva, 2021). Interlingual interference, among other factors, may also hinder the learner in his/her process of acquiring new words. In order to master the features of the word, he or she has to overcome these interfering factors. This interference results from the learner's prerequisites of the mother tongue or a foreign language (Laufer, 1991, p. 82). Eventually, a learner has to deal with factors related to:

❖ *Form*: Ambiguity occurs within similarities in the spoken and written forms of a word; for example, the aural and oral distinction as well as spelling, respectively (Laufer,

1991; McCarthy, O'Keeffe, & Walsh, 2010). For instance, confusion may occur with words like "pray" and "bray"…etc.

- ❖ *Word structure:* implies knowledge of free and bound morphemes that together form the structure of a word. It is crucial for a learner to distinguish roots and affixes in order to generate and create meaningful structures using the correct morphemes (Laufer, 1991). For example, consider the difference in meaning between "interesting" and "interested," as well as the similarity between "precedent" and "antecedent."

- ❖ *Syntactic behavior*: A learner may make errors in the grammatical or syntactic use of some words. This is often due to interference from the mother tongue or previous knowledge of a foreign language (Laufer, 1991). For example, "on" in English is a preposition of place, whereas in French it refers to a third person indefinite personal pronoun.

- ❖ *Meaning*: learners often face difficulties due to a lack of equivalence in meaning. They encounter new L2 words that have meanings overlapping with various meanings in their native language. This challenge is often encountered in words with multiple meanings, metaphors, idioms, and phrasal verbs. When this happens, learners may struggle either to comprehend or to produce the intended meaning (Laufer, 1991).

- ❖ *Lexical Relations*: Difficulties in lexical relations of word forms are encountered with word synonyms and collocations. A learner may misuse a word due to unfamiliarity with synonymous expressions. For example, one might say "beautiful" woman but not "beautiful" man. Errors in collocations, on the other hand, occur when a learner associates a similar collocation in another language. For instance, in English, "pass an exam" means to succeed, while in French, "passer un examen" means to sit for an exam. Other collocations include make an error and do a mistake.

V.   TECHNOLOGY ASSISTED VOCABULARY LEARNING

ICT-based learning approach refers to the delivery of data, information, and instruction through various delivery media such as speakers and computers. This is achieved through presentations using words, pictures, and sensory modalities like auditory and visual means. It is a learner-centered approach (Mayer, 2009). Thankfully, people nowadays can afford wearable technological devices and consoles, which create multiple possibilities and potentialities in second language learning. Technology is no longer thought of as beneficial or detrimental, but rather the ways in which its attributes are used to achieve desired language learning outcomes (González-Fernández & Schmitt, 2017).

After introducing technology into the learning environment, its impact became apparent in terms of learner-teacher interaction, learner-learner interaction, as well as the way learners interact with the technological learning material and devices. When dealing with technology, we primarily refer to Computer-Assisted Language Learning. CAAL and its artifacts take learners' learning to a more sophisticated and personalized level, where mobility, augmentation, and ubiquity are listed as the core affordances of technology (González-Fernández & Schmitt, 2017, p. 371). Mobile-assisted language learning (MALL) is a prime example of mobility, where learning accompanies the learner everywhere they go and whenever they wish. Augmentation offers the opportunity to merge the physical and digital worlds or simply digitize a learning environment using headsets or other types of digital wearables. Moreover, CALL offers a high-quality ubiquitous learning environment where learning is monitored on-site or at a distance through connected learning consoles. This allows for tracking the learning process and facilitating constant and simultaneous interventions when necessary.

Reinders and White (2010) distinguish two major assets afforded by CALL: organizational and pedagogical affordances, as explained in Table 3.

Table 2.3:

Organisational and pedagogical affordances of CALL.

Organisational affordances	Improved access
	Storage and retrieval of learning behavior records and outcomes
	Sharing and recycling of materials
	Cost efficiency
Pedagogical affordances	Improved authenticity of L2 input
	Improved interaction between learners, between learners and native speakers, as well as between learners and instructor
	Situated learning (e.g., the availability of technology outside the classroom to support language use)
	The use of multimedia
	New forms of learning and teaching activities
	Nonlinearity (e.g., through hyperlinking of texts)
	Alternative forms of (giving and receiving) feedback
	Monitoring and recording of learning behavior and progress
	Greater control over the learning process
	Empowerment of learners and teachers by enabling them to make independent choices about their own learning

Note: As cited in (González-Fernández & Schmitt, 2017)

Surprisingly, a cohort of research studies discovered ineffectiveness in technology-assisted vocabulary learning and emphasized the positive outcomes of traditional vocabulary learning strategies (Hao, Wang, & Ardasheva, 2021). This fact could be attributed to the

learners' engagement, the teacher's selection and utilization of the technology tool, as well as its delivery formats, or the context and specific language skill being targeted.

1. Mobile Assisted Language Learning

Technology extends learning beyond time and space. Due to limited classroom time, technology can significantly assist learners in their process of incidental vocabulary learning outside the formal learning context (Hao, Wang , & Ardasheva, 2021). There are many examples of ICT-based vocabulary learning strategies. A cohort of these techniques includes online dictionaries, consulting, and incorporating words with real-world (As cited in, Vnucko & Klimova, 2023, p.6).

It is commonly agreed that vocabulary size is closely related to the learner's ability to make progress in language learning (Anyi, 2019). The increase in engagement rates through mobile learning can guarantee a positive outcome in terms of language learning. Learner characteristics, proficiency in the target language, educational level, and age factor have a significant effect on second language learning (As cited in Hao, Wang, & Ardasheva, 2021,p. 648). Surprisingly, Saprudin et al. (2019) found that class size does not affect learning vocabulary through digital gaming, making it effective in both large and small classes (Vnucko & Klimova, 2023).

In a meta-analysis, Hao, Wang, & Ardasheva (2021) reported that potential moderators affecting vocabulary learning through ICTs could depend on the device (computer vs. mobile-based), delivery format (game vs. non-game-based), the setting (classroom), duration, as well as test formats. Else, using a variety of technological devices stimulates learners' interest due to more frequent verbal and multimedia exposures and interaction opportunities with the target language.

2. **The Technology Pedagogy Content Knowledge Framework**

In multimedia learning, teachers are not only required to have a good mastery of the content to be delivered to learners but they'd better be aware of technological means they use in their teaching. The Technology Pedagogy Content Knowledge (TPCK) is a framework developed to encompass the most important competences a teacher must have in order to successfully deliver the end product to the learner. A bit of history related to this theory goes back to 1986 by Lee S. Shulman who developed the primary theory based on the teachers' knowledge of Content and Pedagogy (Harris & Hofer, 2010). Later, the burst of technological revolution gave a new insight to Lee S. Shulman's (1987) work; an attempt that resulted in the TPCK model in 1986. This model refers to TPCK and it was reformulated by Punya Mishra, and Matthew J. Koehler in 2006; the idea itself is about knowing three areas of technology, pedagogy and content while teaching (Mishra & Koehler, 2006). These three areas when overlapped result in a framework pictured in the Venn diagram below:

Figure 2.1: Technology Pedagogy and Content Knowledge framework
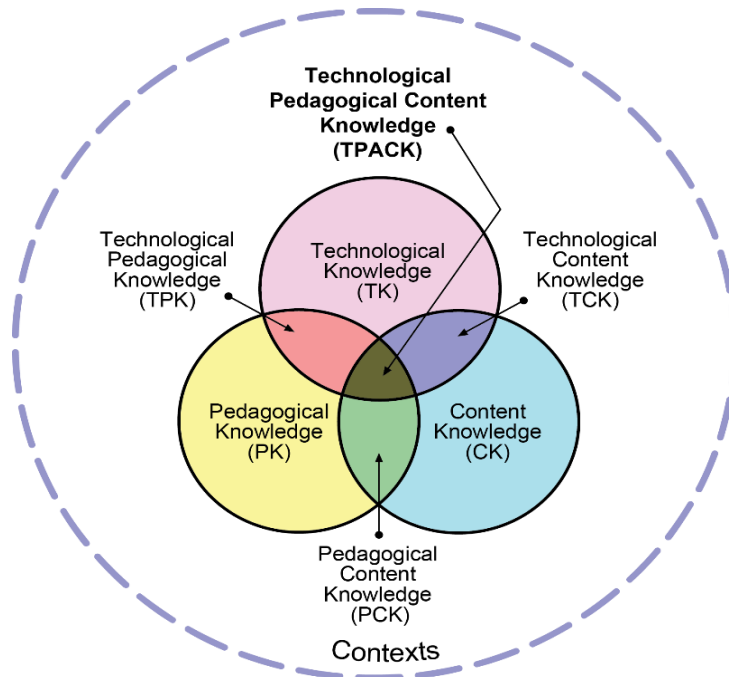
(Reprinted from: Mishra & Koehler, 2006, p. 1025).

A good understanding of the TPCK theory provides a foundation for technology-based classrooms, curriculum development, and teacher education. It also structures the learners' educational experience. Mishra & Koehler (2006) believe that teachers' knowledge should encompass all three areas;

> TPACK represents a class of knowledge that is central to teachers' work with technology. This knowledge would not typically be held by technologically proficient subject matter experts, or by technologists who know little of the subject or of pedagogy, or by teachers who know little of that subject or about technology.

> (Hill, 2019, para. 5).

Yet, it could be utopian to aspire for teachers who perfectly master all aspects of the framework. One might excel in pedagogy and content knowledge but know less about technology (Digital Technologies Hub, 2023). Moreover, Mishra and Koehler (2006) argue that a lack of understanding of the framework may keep technology always separated from teaching and learning, which results in a number of problems. When technology is not well integrated with content and pedagogy, it can be challenging to keep up with the rapid changes in software and apps. Teachers may end up expending all their energy and focus on deciding which technology to use rather than on how to effectively utilize it (Hill, 2019).

3. Gamification as a Method for Vocabulary Learning

Similarly to computers, mobile devices can also serve as moderators of game-based language learning. With constant changes in technology-assisted learning devices and consoles, Game-Based Language Learning (GBLL) and Digital Game-Based Learning (DGBL) are considered by some researchers as fields in themselves due to their highly engaging characteristics and complexity (Cited in Hao, Wang , & Ardasheva, 2021, 649). Moreover, the concept of DGB language learning emerged in the field of study by the 2010s, thanks to Gee and Prensky by 2010's (Vnucko & Klimova, 2023).

According to Chen et al. (2016), game genres affect the learning outcomes as well as learners' engagement. For example, adventure games can be more appealing and stimulating because they incite cognitive processes such as critical thinking, task management, and problem-solving (As cited in, Vnucko & Klimova, 2023, p. 18). Additionally, they argue that successful digital game-based learning depends on the game features rather than the learner category (cited in Anyi, 2019, p.2)

Empirical research has shown that digital gaming leads to positive outcomes in terms of self-confidence, autonomy, and motivation due to a more engaging, interesting, and risk-free learning environment (Vnucko & Klimova, 2023; Anyi, 2019; Abrams & Walsh, 2014). Nonetheless, not only do digital games increase learners' engagement, but they also yield positive language learning outcomes by providing more exposure to the four language skills (Vnucko & Klimova, 2023). Further, a gamified approach to learning provides an opportunity for personalized and individualized vocabulary acquisition, as well as sustained engagement and interest in building a vast repertoire of words (Abrams & Walsh, 2014, p. 56). Moreover, gamification reduces the rate of anxiety by allowing learners to make errors and providing them with opportunities for multiple trials. Similarly, positive feedback provided after a successful trial or task completion engenders a feeling of achievement, which keeps the learner engaged in the learning environment and surpasses their previous failed attempts (Bourke, 2019).

Synthesis research has reported a significant effect of game-based delivery formats on vocabulary compared to non-game-based contexts (cited in Hao, Wang, & Ardasheva, 2021). DGBL has proven its efficacy in learning on different levels, namely the cognitive area, which encompasses learning outcomes, behavioral, affective, and motivational outcomes (Vnucko & Klimova, 2023). Furthermore, in a meta-analysis of prominent studies in the field of Digital Game-Based Learning (DGBL), Vnucko and Klimova (2023) discovered that the majority of experimental or quasi-experimental studies concluded that gaming vocabulary is highly beneficial across all age groups. Gamification and gaming, in particular, can be beneficial in vocabulary learning in many ways. Rasti-Behbahani (2021) reviewed the most significant studies and reported seven paramount assets of Digital Game-Based Vocabulary Learning (DGBVL):

- Higher motivation levels

- Different types of repetition

- Varied feedback

- Authentic contexts of learning in the virtual world

- Rich context for sual encoding

- Higher level of interaction, manipulation and control compared to conetent

- Richer instantiations for words

In a study conducted on the usefulness of adaptive technology and gamified practice for vocabulary learning, Abrams and Walsh (2014) found out that the game-like features of the Challenge project, which is on Vocabulary.com, offered an effective hybrid teaching tool that provided independent and flexible learning opportunities. Additionally, visual contexts and multimodal representations of words through annotations and glosses support a better understanding and development of vocabulary knowledge. Using gaming for language learning opens the door to extracurricular activities that facilitate vocabulary acquisition (Vnucko & Klimova, 2023), thereby alleviating the burden on teachers for additional incidental vocabulary instruction. Yet, digital vocabulary learning games are less utilized compared to serious games (Abrams & Walsh, 2014).

VI.   DEFFICIANCIES IN TECHNOLOGY ASSISTED VOCABULARY LEARNING

Incontrovertibly, technology is considered a promising tool for learning in general, and especially for language learning (Wolff, 2021 & Unesco, 2023). This claim remains valid until other alternatives or innovations emerge in the field of learning research. Like any medication, technology may have side effects or undesirable outcomes due to factors beyond our control.

Using technology for entertainment rather than purposeful learning can lead to ineffective outcomes. Therefore, teachers should intentionally incorporate gaming into vocabulary learning to achieve the desired objectives. Additionally, teachers need to consider the selection of games, as the vocabulary in some games may be difficult and complex for learners (Vnucko & Klimova, 2023).

Yip & Kwan (2006) argued that gaming features that are not closely related to vocabulary learning might divert learners from the learning focus, especially when using shooting-based or time-based games. Moreover, the immersion factor may increase the cognitive load, which can eventually cause learners to shift from learning, hindering the process of vocabulary acquisition and retention (Vnucko & Klimova, 2023).

Some scholars, like Schaaf (2012), argue that gamification might not always be a magic bullet approach to all educational purposes. Instructors should not take for granted that a gamified course will yield positive outcomes; they may not be prepared for it (as cited in Bourke, 2019, p. 8). Moreover, game elements may put learners in stressful situations that could impede the learning process. (Sailer et al., 2013) suggest that learners' negative emotional responses may lead to undesirable performance in the course (As cited in, Bourke, 2019 p. 9,).

VII.   VOCABULARY LEARNING AND RETENTION

When encountering a new word, the learner makes efforts to aid in their progress while reading or listening. He can either ignore it or guess its meaning from context, look up the newly encountered word in the dictionary, jot down the word's meaning on a card for later use, or simply grasp the meaning and incorporate it immediately (Nation, 2013, p. 40). Griffiths

(2008) reported that poor learners should learn from successful ones in order to improve success records, specifying that aptitude, motivation and opportunity are paramount characteristics of these good learners (Griffiths, 2008, p. 1)

1. **Learner's Intellectual Engagement in Vocabulary Learning Process**

The learner's cognitive operations create semantic or structural elaborations to recall the word in question. These elaborations take different forms, such as intra-lingual associations, visual or auditory associations, as well as translations that help learners recall the word when encountered again. Moreover, the mind alternates between using semantic and structural elaborations. However, it initially processes the meaning of words before addressing their form and spelling features (Zwier & Boers, 2023, p. 208).

Arguably, Carter & McCarthy (2013) emphasize that "the question of retention is a complex one" (p. 12). He raised the question of which attempt is more easily retained: synonymous meanings of a single word or an identical number of different words. Researchers argue that word learning is dependent on the acquisition of other words, yet the occurrence and processing of this interrelation in the mental lexicon are not yet fully explained (González-Fernández & Schmitt, 2017).

In the same vein, the role of the teacher is as crucial as learners' efforts in processing new lexis. Zwier & Boers (2023) argue that teachers use a variety of elaboration techniques as mnemonics when introducing new vocabulary to help learners connect the new words to previously known words, objects, or expressions….etc, namely through techniques like:

A- Making comparison between L1 and the target language: either through translation, false friends or lookalikes. Taking the example of the French word 'passer un examen' which means to sit for an exam whereas 'pass an exam' means to succeed it.

B- Inter-lingual comparison: learners may learn a new word using as reference another synonym or antonym word or word families or word senses; which enlarges the scope of his vocabulary.

C- The history of the word or expression: to make a word more memorable, teachers may refer to anecdotes or etymology. A new word will get easily enlaced to the learners memory if its origin and history is known to them. This applies mostly to loanwords, idiomatic expressions …etc.

D- Catchy combinations: word combinations that rhyme or sound to the learner's ear, are likely to be retained. Taking the example of 'practice makes perfect' or 'fair and square'. The reason is that the learner's ear is more sensitive to phonological repetitions and alliterations than conventional word combinations.

E- Visualizing meaning through picture or gesture: linking a word to an object is feasible, but learners face difficulties making sense of some abstract words and recalling them. Gestures and acting out the sense of the word by the teacher can effortlessly establish the word and its meaning in the learner's memory. Teacher may act out the word 'angry' using frowned eyebrows and open screaming mouth or by pretending to break or throw objects, when same scene is displayed, learners are likely to recall the referent word. Interestingly, when learners mime actions verbs so that their peers guess the lexical item, the retention and consolidation rates gets even stronger (Zwier & Boers, 2023).

F- Cutting multiword into parts: quite common and helpful, if one part of the word is known, learner might establish the meaning of a whole. It is referred to as the 'word-part technique' This applies to roots and affixes,

Vocabulary that has been learnt needs to be reviewed regularly to ensure retention, as forgetfulness occurs shortly after the learning session ends. Efficient recycling ensures a successful consolidation of words and enhances various aspects of word knowledge (Schmitt, 2010, p. 35). When we have a clear understanding of the timing of retention decrease, it becomes easier for learners to schedule repeated rehearsals of the items they have learned. According to (Schmitt 2000,p131), recycling of learning should be done within 10 minutes after the session ends and repeated at gradual intervals ranging from a few days to a week or even a month, etc. This enables the learner to retrieve information more efficiently (Cited in, Schmitt, 2010). Figure 2 depicts the pattern of forgetting unrecycled information, whereas Figure 3 shows the ease of retrieving information through constant recycling developed by (Schmitt 2000, p.131).

Figure 2.2:

Typical forgetting pattern
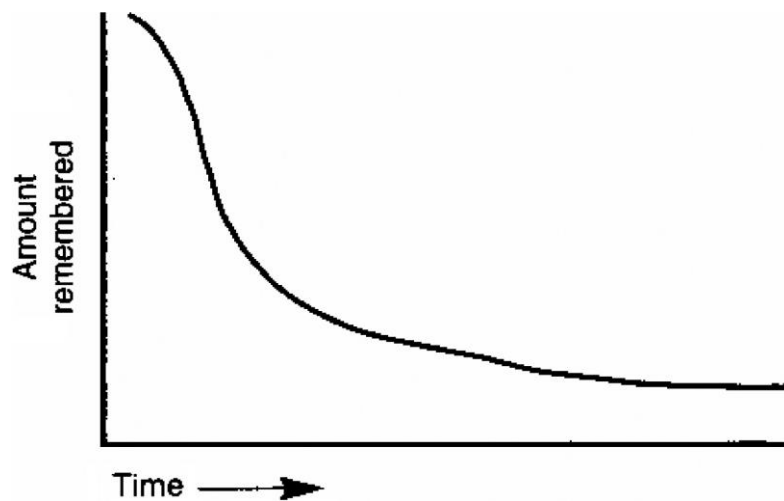
Note: Reprinted from (Schmitt 2000,p. 131)

Figure 2.3:

Forgetting pattern with expanding rehearsal
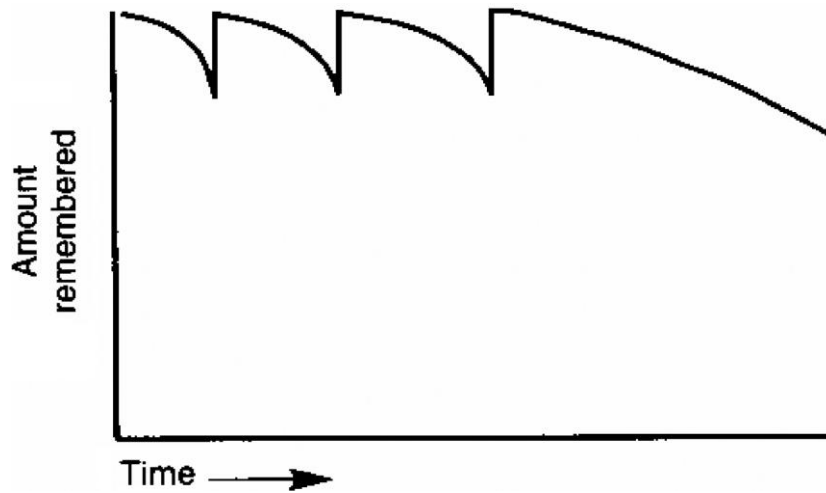
Note: Reprinted from (Schmitt 2000,p. 131).

2. **The Working Memory and Vocabulary Retention**

Learners create mental elaborations of the newly learned words to retain and recall them later. These elaborations take different forms, such as intra-language associations (Zwier & Boers, 2023, p. 206). Linguistic presentations occupy a place in the modular system of the mind, and language processing, in particular, is receiving increasing attention, especially concerning working memory. The latter is explained by Miller, Galanter, and Pribram (1960, p. 65) as "some special state or place where a plan can be remembered while it is being executed" (As cited in Truscott, 2022, p. 9) .

According to Baddeley (2003), rehearsal and elaboration are essential to facilitate the recall of vocabulary. He argues that "working memory involves the temporary storage and manipulation of information that is assumed to be necessary for a wide range of complex

cognitive activities" (Baddeley, 2003, p. 189). The working memory is not only concerned with cognitive processing; it also has emotional and affective implications. It is believed that affective working memory may contribute to language sciences, bilingualism, and SLA research (Wen , Teng , Han, & Zeng, 2022).

Interestingly, it is believed that engaging learners in deeper processing activities, such as forming associations and using the keyword technique, contributes to a better retention rate of the manipulated information (Schmitt, 2007). The keyword technique is considered to be quite helpful in retaining vocabulary. It involves an auditory and/or visual association between the target language word and the native language word. Eventually, more words would be retained thanks to the associations made (Atkinson and Raugh 1975; Nation 1983, as cited in Carter & McCarthy, 2013, p. 12).

3. Gamification as a Tool for Recalling Vocabulary

Using digital gaming while learning languages has been shown to reduce anxiety, leading to improved memory and vocabulary retention (Vnucko & Klimova, 2023). Gamified vocabulary learning allows learners to engage with words in various ways, including through sounds, images, and hints in an active learning environment marked by challenge, interaction, and immediate feedback (Abrams & Walsh, 2014). This environment increases the likelihood that learners will remember words when the opportunity arises. Furthermore, games provide a chance for repeated trials, which promotes incidental vocabulary learning because learners encounter the new word more than once and in different contexts (Abu Bakar & Nosratirad, 2013).

Interestingly, recalling information is linked to how we initially receive it. Some researchers argue that information retrieval becomes easier when encoding input occurs in a

positive setting. A learning environment characterized by excitement, positive sensory experiences, and engagement increases dopamine levels, leading to longer memorization and more accurate recall of information (As cited in Kralova , Kamenicka , & Tirpakova, 2022, p. 5). When learners discuss and practice content, the retention rate is around 70% to 80% (Aka, 2017).

VIII.   BLOOM'S TAXONOMY

In an attempt to refine specific educational objectives, Benjamin Bloom developed a classification of instructional actionable objectives that assist teachers and instructional designers in comprehending the learning process and ultimately targeting the appropriate cognitive processing of their learners. The educational psychologist Benjamin Bloom first published the so-called Bloom's taxonomy in 1956. Later on, it underwent some amendments that are widely adopted even today. Bloom's Taxonomy is a crucial teaching tool used to guide learning and align it with the intended learning objectives.

1. Definition and Background of Bloom's Taxonomy

Benjamin Bloom delved into the intricacies of human thinking and identified the cognitive processes involved in learning. The focus of his work throughout his life was to enhance the learning experience for students (Cited in Forehand, 2005). It was not an easy task actually. He invited a cohort of researchers during the Convention of the American Psychological Association in 1948 and they sought altogether to classify and group the thinking behaviours that are thought to be necessary in learning (Forehand, Bloom's taxonomy: Original and revised, 2005). After eight years of hard arduous work, the group of researchers led by

Bloom completed and published the book 'Bloom's taxonomy' that tackles the cognitive domain of the human thinking behaviour out of three domains; cognitive, affective and psychomotor domains (Forehand, Bloom's taxonomy: Original and revised, 2005).

However, there was a debate among the researchers over the use of the unfamiliar novel term 'taxonomy', yet the essence of the idea caught the attention of educational stakeholders worldwide, including curriculum designers, researchers, and teachers (As cited in Forehand, 2005, p.41). The classification is tiered into a hierarchy of six levels of cognitive complexity, ranging from basic (knowledge, comprehension, and application) to advanced (analysis, synthesis, and evaluation). Despite the fact that little attention was given to Bloom's taxonomy when it emerged, it was translated into 22 languages. Since then, it has become the most referenced resource in education (Forehand, Bloom's taxonomy: Original and revised, 2005).

2. Bloom's Primary Version of the Taxonomy

Bloom's taxonomy is a classification of six categories of thinking. Each category includes a list of measurable verbs used to describe observable cognitive actions such as knowledge, skills, attitudes, behaviours, and abilities performed by the learner throughout their learning (Shulman, Counting and Recounting: Assessment and the Quest for Accountability, 2007) The taxonomy's action verbs address common questions associated with each level of thinking. For example, at the initial level of remembering or knowledge, the learner is prompted to define, identify, or recall information presented by the teacher. At the understanding or comprehension level, a sample question could be: "What did you observe?"? How would you describe...?

It addresses three main learning domains, namely cognitive, affective, and psychomotor domains. Else, the taxonomy follows an increasing order of the thinking process from Lower

Order Thinking Skills (LOTS) to Higher Order Thinking Skills (HOTS) depicted in six actions: knowledge, comprehension, application, analysis, synthesis, and evaluation, respectively (Churches, 2009). These cognitive processes gradually increase from simple to more complex functions (Wilson, 2001, p.2), and they belong to three core human learning domains (Forehand, Bloom's taxonomy: Original and revised, 2005, p. 41):

G- **Cognitive domain** knowledge based

H- **Affective domain** attitudinal based

I- **Psychomotor domain** skills based

3. The Revised Version of Bloom's Taxonomy

Five decades later, Bloom's student Lorin Anderson collaborated with David Krathwohl in the 1990s and attempted to enhance the classification by assigning a verb to each process level. These changes were not made out of the blue, but they were the result of the hard work of experts such as cognitive psychologists, curriculum theorists, instructional researchers, as well as testing and assessment specialists. Their endeavour was finally published in 2001 (Anderson & Krathwohl, 2001). The revised taxonomy included a rearrangement of the six actions, substituting nouns for verbs, and giving consideration to lower and higher order skills: remember, understand, apply, analyse, evaluate, and create (Churches, 2009). Additionally, Wilson (2001) provided a succinct distinction between the original and the revised versions of Bloom's taxonomy; the chart below differentiates both versions in terms of terminology (noun/verb) and placement:

Figure 2.4:

Bloom's taxonomy, Original VS revised version Source
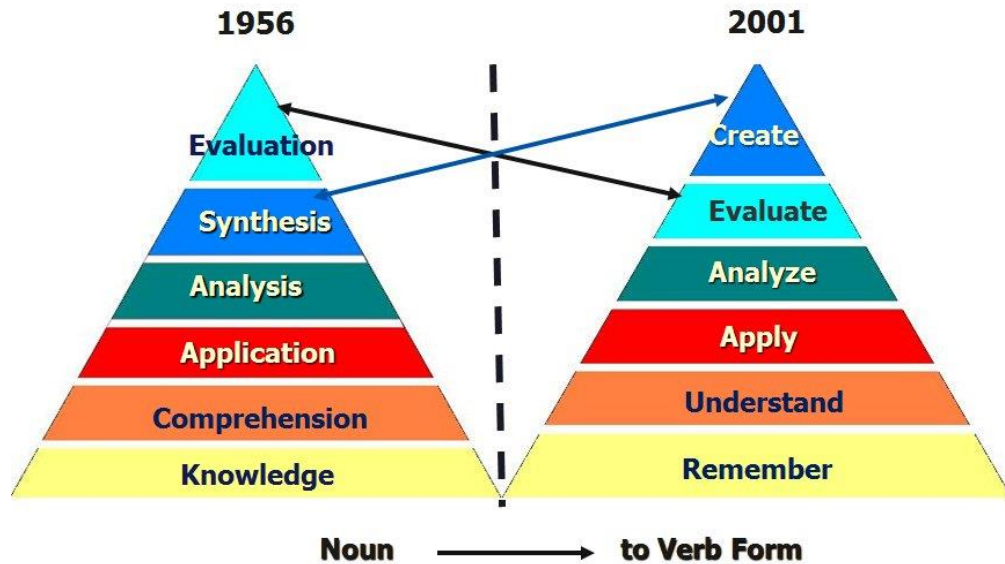
Note: Reprinted from (Wilson, 2001)

Furthermore, Wilson (2001) also emphasizes significant changes and provides a clear explanation of action verbs for effective use by teachers. The table below includes a detailed description of each cognitive category. The actions and the verbs mentioned in both versions are labels of the activities, actions, processes and objectives undertaken in the classroom (Churches, 2009). Apart from the classical mode of knowledge transmission, efficient learning puts more emphasis on the way learners understand and apply received information (Mayer, 2009, p. 19).

Table 2.4:

Bloom's taxonomy vs Anderson and Krathwohl's Taxonomy

Bloom's Taxonomy 1956	Anderson and Krathwohl's Taxonomy 2001
1. **Knowledge**: Remembering or retrieving previously learned material. Examples of verbs that relate to this function are: <table><tr><td>know identify relate list</td><td>define recall memorize repeat</td><td>record name recognize acquire</td></tr></table>	1. **Remembering**: Recognizing or recalling knowledge from memory. Remembering is when memory is used to produce or retrieve definitions, facts, or lists, or to recite previously learned information.
2. **Comprehension**: The ability to grasp or construct meaning from material. Examples of verbs that relate to this function are: <table><tr><td>restate locate report recognize explain express</td><td>identify discuss describe discuss review infer</td><td>illustrate interpret draw represent differentiate conclude</td></tr></table>	2. **Understanding**: Constructing meaning from different types of functions be they written or graphic messages or activities like interpreting, exemplifying, classifying, summarizing, inferring, comparing, or explaining.

4. **Application**:	3. <u>**Applying**</u>:
The ability to use learned material, or to implement material in new and concrete situations. Examples of verbs that relate to this function are:	Carrying out or using a procedure through executing, or implementing. *Applying* relates to or refers to situations where learned material is used through products like models, presentations, interviews or simulations.

apply relate develop translate use operate	organize employ restructure interpret demonstrate illustrate	practice calculate show exhibit dramatize

4. **Analysis**: The ability to break down or distinguish the parts of material into its components so that its organizational structure may be better understood. Examples of verbs that relate to this function are:	4. <u>**Analyzing**</u>:
	Breaking materials or concepts into parts, determining how the parts relate to one another or how they interrelate, or how the parts relate to an overall structure or purpose. Mental actions included in this function are *differentiating, organizing, and attributing,* as well as *being able to distinguish between* the components or parts. When one is analyzing, he/she can illustrate this mental function by creating

analyze compare probe inquire examine	differentiate contrast investigate detect survey	experiment scrutinize discover inspect dissect

contrast	classify	discriminate
categorize	deduce	separate

spreadsheets, surveys, charts, or diagrams, or graphic representations.

5. **Synthesis**: The ability to put parts together to form a coherent or unique new whole. Examples of verbs that relate to this function are:

compose	plan invent	propose
produce	formulate	develop
design	collect set up	arrange
assemble	generalize	construct
create	document	organize
prepare	combine	originate
predict	relate	derive write
modify tell		propose

5. **Evaluating**:

Making judgments based on criteria and standards through checking and critiquing. Critiques, recommendations, and reports are some of the products that can be created to demonstrate the processes of evaluation. In the newer taxonomy, *evaluating* comes before creating as it is often a necessary part of the precursory behavior before one creates something.

6. **Evaluation**: The ability to judge, check, and even critique the value of material for a given purpose. Examples of verbs that relate to this function are:

judge assess	argue decide	validate
compare	choose rate	consider

6. **Creating**:

Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing. Creating requires users to put parts together in a new way, or synthesize

			parts into something new and different creating a new form or product. This process is the most difficult mental function in the new taxonomy.
evaluate	select	appraise	
conclude	estimate	value	
measure		criticize infer	
deduce			

Note: As cited in (Wilson, 2001)

The taxonomy paves the way to a well-structured learning and it fits the contemporary teacher's needs. Yet, the digital learner or as Prensky coined 'the digital native' has more sophisticated objectives and aspirations; and so is the case with the novel emergence of Bloom's digital taxonomy.

4- Bloom's Digital Taxonomy

The digitized version of the taxonomy emerged to cope with technological advances that are developing at a rapid pace. This digital taxonomy encompasses current actions and provides opportunities for fostering 21st-century skills, such as digital content creation, curation, and online collaboration. The latter is a key 21st-century skill (Churches, 2009) since collaborative learning contributes to developing learners' previous knowledge and adding new competencies to their repertoire. A large number of collaborative tools come in the form of wikis, classroom blogs, social networks, and learning management systems. These tools serve as facilitators of 21st-century teaching and learning skills (Churches, 2009).

Bloom's Taxonomy of learning is described as a process that primarily begins with remembering a concept in order to understand it. The application requires a good understanding. When it is applied, it can be analysed. A thorough analysis is essential for evaluating its results. Consequently, learners will reach the highest level of thinking, which is the fruit of all the previous processes: creating. Churches (2009) argues that learning does not necessarily start from scratch; it can occur at any level. As far as revisions are concerned, one of their motives is the nature of the learner's society and the way education is practiced and perceived. So, it is important to incorporate new knowledge into the existing framework (Anderson & Krathwohl, 2001).

IX.   BLOOM'S TAXONOMY IN RELATION TO VOCABULARY LEARNING and PEDAGODY

According to Aka (2017), there should be active collaborative learning starting from the very basic level of the learning process, knowledge, in order for learners to retain the information they have learned. In other words, an effective application of Bloom's Taxonomy leads to an interactive and dynamic classroom environment characterized by practical application and creativity.

Good language learners demonstrate their mastery through a substantial amount of vocabulary knowledge and usage (Alasmari, 2020). Good language teachers, on the other hand, help their learners grasp as much vocabulary as possible through an effective application of Bloom's Taxonomy. Presenting vocabulary gradually, and progressively increasing complexity help learners develop their thinking skills in alignment with the requirements of the presented material. In other words, a learner cannot form a sentence about an action in the past tense (applying level) without being introduced to different time adverbials of the past tense

(understanding level). Hence, Bloom's Taxonomy has been proven to enhance both learning and thinking skills of learners (Gershon, 2018).

1. **Word Processing through Bloom's Taxonomy**

It is important to incorporate higher-order thinking skills in vocabulary classes. Teachers often teach vocabulary superficially, placing more emphasis on definitions. They fail to align vocabulary instruction with best practices such as repeated exposures, words in context, and word interaction (Kingsley & Grabner-Hagen, 2017). Adding to that, Dickinson, et al. (2012) argue that learners and younger children in particular, should be introduced to language through Bloom's taxonomy at an early stage as it ensures positive performance. Consequently, many researchers argue that learners' cognitive activity during learning greatly influences positive performance and outcomes (Mayer, 2009, p. 22).

Learning at the lower order of thinking, which involves remembering, is a necessary step, but it should not be pursued in isolation. This aspect of Bloom's puzzle, as referenced by Forehand (2005), needs to be strengthened through application at a higher processing level (Churches, 2009, p. 10). Churches (2009) depicts word processing in accordance with Bloom's Taxonomy as follows:

Figure 2.5:

Word processing based on Bloom's taxonomy
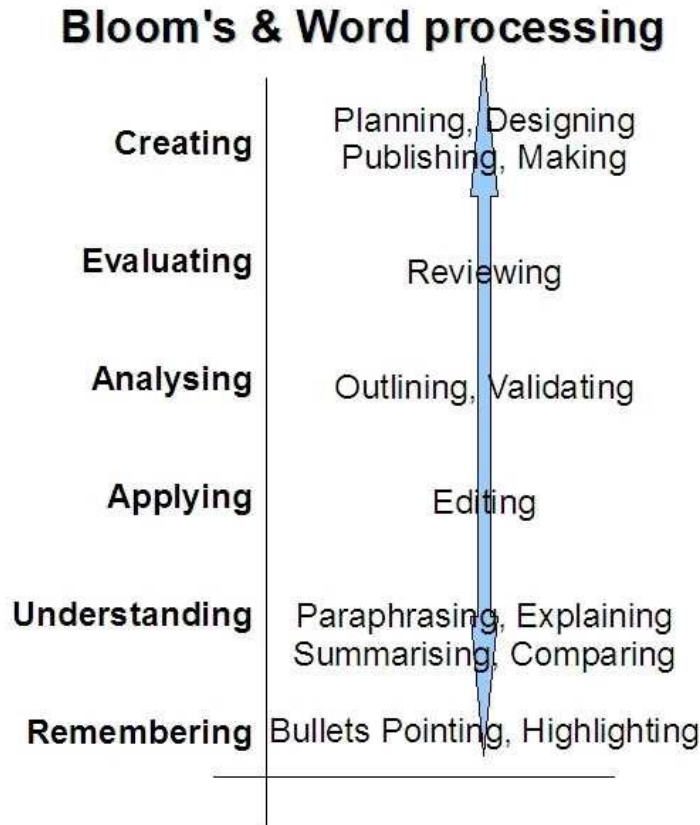
Note: Reprinted from (Churches, 2009)

X.   BLOOM'S TAXONOMY IN RELATION TO GAMIFICATION

When referring to gamification, multimedia emerges as the primary tool for learning. As Mayer (2009) states, "multimedia is a vehicle for efficiently delivering information to the learner" (p. 16). He adds in his book that multimedia learning should be, first and foremost, a source for knowledge construction, where the learner acts as an active sense-maker and the teacher as a cognitive guide (p. 18). ICTs act as facilitators of learning in a way that learners learn with ICTs, not from ICTs. A computer is the tool used to organize and interpret knowledge by the learner who designs his own knowledge (Mitra, 2021). As per games and knowledge,

Kulpa (2017) states that some characteristics are commonly shared by games and learning, including clear goals, rules or guidelines, voluntary participation, and feedback (As cited in, Bourke, 2019, p. 2).

1. Bloom's Digital Technology

The digital version of Bloom's Taxonomy includes verbs and tools that are specific to learning through multimedia, such as blogging, filming, emailing, etc. These technological tools help learners and teachers shift from ineffective modes of learning to a more meaningful learning experience characterized by positive outcomes in terms of knowledge retention and transfer (Mayer, 2009, p. 20). The table below (**Table 2.5)** illustrates the chief goals of learning through ICTs with reference to two cognitive processing levels of Bloom's taxonomy:

Table 2.5:

Goals of multimedia learning

Goal	Definition	Test	Example test item
Remembering	Ability to reproduce or recognize presented material	Retention	Write down all you can remember from the passage you just read.
Understanding	Ability to use presented material in novel situations	Transfer	List some ways to improve the reliability of the device you just read about.

Note: As cited in (Mayer, 2009, p. 20).

In similar vein, the digital version of Bloom's taxonomy comprehend action verbs that suits the learning needs and objectives of a digitalised era. Churches (2009) developed a map thereof that would enable the nowadays e-learner and e-teacher to process knowledge following Bloom's cognitive framework in a digital setting. See (Figure 2.5).

Figure 2.6:

 Bloom's digital taxonomy map

Bloom's Digital Taxonomy Concept map.
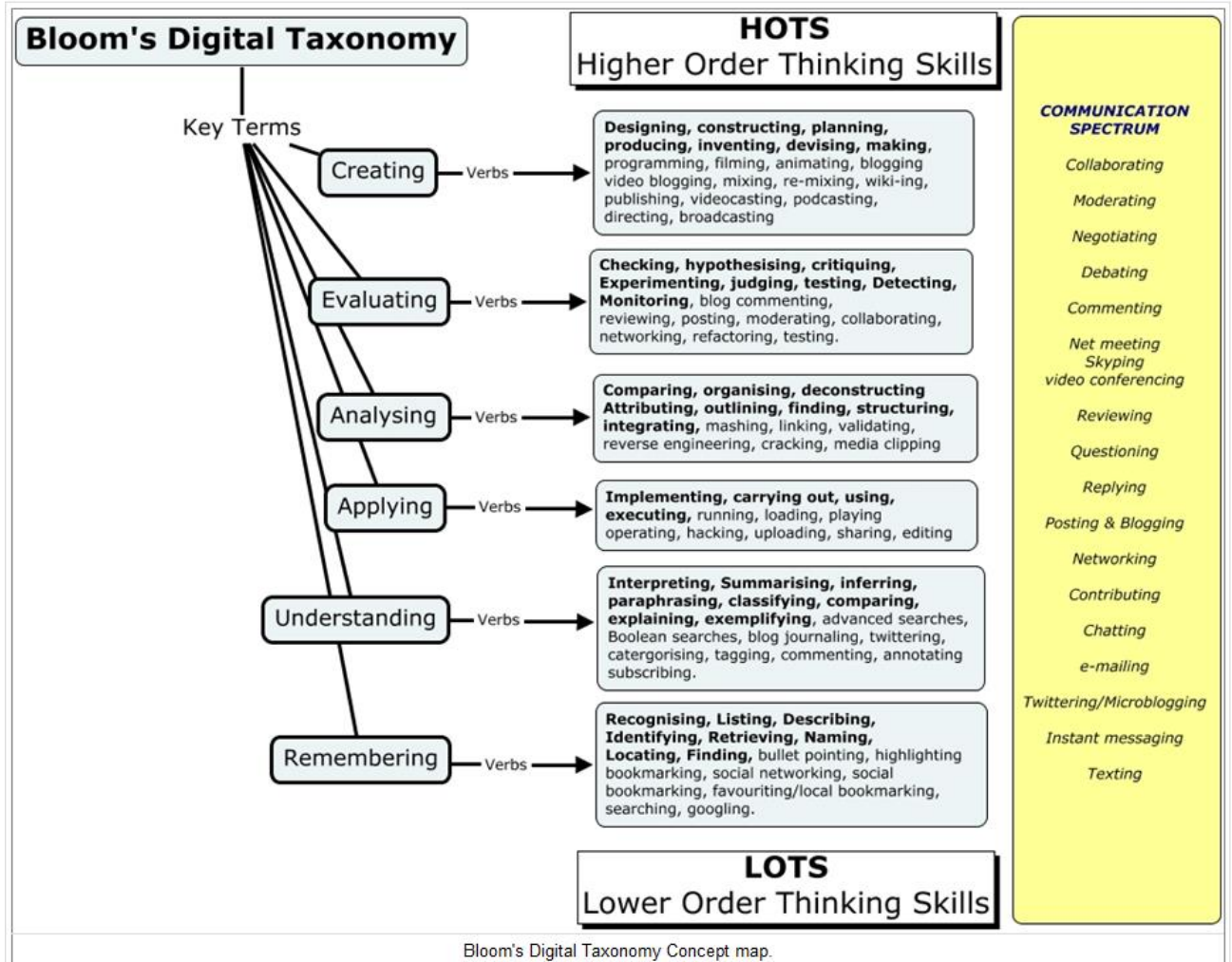
Note: Reprinted from (Churches, 2009)

2. Gamified Education through Bloom's Taxonomy

Both educational gamification and Bloom's Taxonomy seek to promote critical thinking and problem-solving skills. In terms of vocabulary learning, gamification is "a way to get students interested and excited about words, develop a playful context, and create a space for comprehensive vocabulary instruction" (Kingsley & Grabner-Hagen, 2017, p.1). Internet, gameplay, and new media have revolutionized modern education. Digital students interact with

content differently, and gamification utilizes gameplay for educational purposes (Kingsley & Grabner-Hagen, 2017).

Using gamification for instructional vocabulary is not about fun and games like in game-based learning; instead, it is a framework of instruction with an added layer of enjoyment to enhance vocabulary development (As cited in, Kingsley & Grabner-Hagen, 2017, p. 1). When learning is presented in a gamified form, learners are motivated to acquire knowledge in order to advance in the game. Game elements like challenge, competition and levels stimulates the cognitive abilities of learners to reach higher order thinking skills of Bloom's whereby gamification "helps students develop the skills needed to apply concepts to complex issues" (Bourke, 2019, p. 14). Learners are more inclined to welcome gamified learning for a many reasons; the latter is a powerful engaging tool for learning, learners show easiness and comfort towards technology and gamification offers novel and unique learning experience sought for by learners to escape traditional learning settings (As cited in Bourke, 2019, p. 8).

Gamified vocabulary instruction differs from traditional teacher/learner or top-down instruction. When designing a gameful classroom, learners transform into players who strive to complete quests (lessons) and accumulate experience points (grades) to outperform other players, teams, or previous scores. They aim to reach the highest level (summative assessment) based on the curriculum (Kingsley & Grabner-Hagen, 2017).

While Forehand (2005) believes that Bloom's taxonomy is a composition of puzzle pieces that should fit perfectly, where skipping levels would not lead to a positive outcome, Churches (2009) thinks differently. He argues that learning does not necessarily start at the lowest taxonomic level; it can commence at any level. The skipped levels would be encompassed within the scaffolded learning task.

Giving consideration to gamified learning, Kingsley & Grabner-Hagen (2017) adapted a gamified version of Bloom's Taxonomy to benefit gamified curriculum designers as well as teachers who seek to incorporate gamification into Bloom's Taxonomy (Figure 2.8):

Figure 2.7:

Revised Bloom's Taxonomy Ranked by Gaming Levels
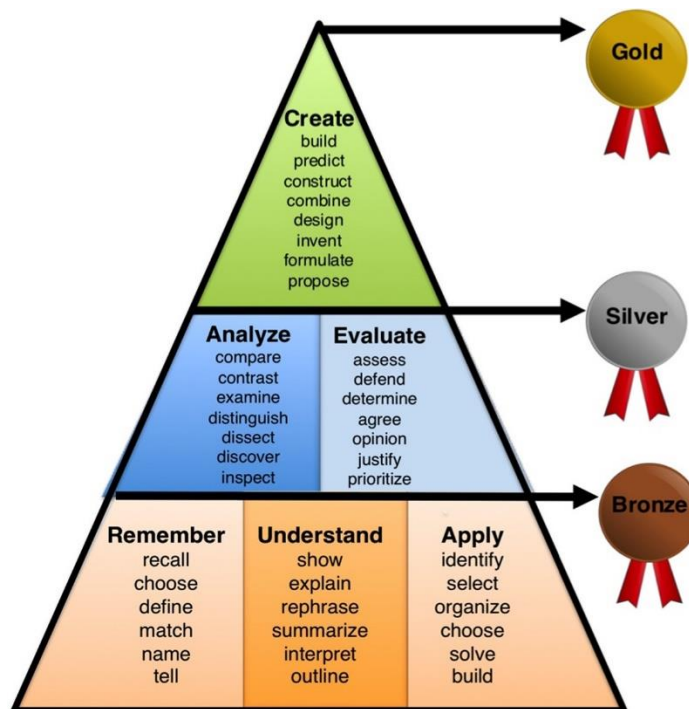
Note: Reprinted from (Kingsley & Grabner-Hagen, 2017)*.*

The essential part of Bloom's Taxonomy is "remembering" because it is crucial for learners to retain necessary information and recall it when needed. Information presented in video or animation formats is more likely to be remembered by the learner (Cloke, 2022). In the design of a training program, teachers pay meticulous attention to reformulating clear and concise learning objectives. Bloom's taxonomy is a key tool used by teachers to address the

appropriate learning level and ensure that the content and assessment tools are well-aligned with the learning objectives (Cloke, 2022).

Gamification presents complex scenarios where quests extend beyond basic knowledge or recall; they involve higher cognitive processes such as problem-solving and critical thinking, utilizing Bloom's analysis and creation within an immersive experience (Bourke, 2019). The common features between gamified and traditional instruction are the learning goals and key concepts essential for academic achievement (Kingsley & Grabner-Hagen, Vocabulary by Gamification, 2017).

Learners who can build new skills, data, or information based on previously acquired knowledge can easily advance to higher-order thinking skills. Through gameplay, gamification provides a canvas that boosts learners' creativity, enabling them to challenge themselves and become reflective thinkers (Bourke, 2019).

Conclusion

Numerous studies contribute to the expanding field of language and vocabulary acquisition. Cognitively speaking, polyglots and multilinguals are known for their multitasking skills. Their brains have the ability to shift and alternate between languages, which promotes flexibility in thinking. Gaming, on the other hand, has been proven to enhance critical thinking and problem-solving skills. Hence, a combination of digital gamified education would enhance the quality of learning.

The present chapter discusses each variable in detail to provide the reader with a clear understanding of vocabulary learning and retention, technology-assisted learning, gamified language learning, as well as Bloom's taxonomy, which is the foundation for the successful

design of learning and teaching. At first, the chapter starts with a brief explanation of the building blocks of language acquisition and learning, namely lexis, vocabulary, lexicology, and morphology. Secondly, the author presents the process of vocabulary learning to acquaint the reader with the cycle of vocabulary acquisition, strategies, and taxonomies used by teachers and learners, as well as the obstacles encountered during the vocabulary learning process. Then, learning through ICTs is discussed in terms of computer and mobile-assisted learning, as well as gamified learning. Later in the chapter, deficiencies in technology-based language and vocabulary learning are explained to highlight the gaps in research areas. After addressing vocabulary learning, the author discusses vocabulary retention, including types of memory and the role of gamification in vocabulary retention. After that, an explanation follows about the three updates of Bloom's Taxonomy, with a particular emphasis on the cognitive domain. This is essential to help understand the importance of the taxonomy in designing teaching and learning. Lastly, Bloom's Taxonomy is approached from different angles, one of which is gamification, where the digital version of Bloom's Taxonomy serves as a reference for designing digital learning. It is an undeniable fact that language is an integral component of human existence. A person's ability to express themselves well is embodied in the words they utter. It is then no surprise that Winston Churchill, a gifted politician and writer, was awarded the Nobel Prize for Literature in 1953.

CHAPTER THREE: SCOPE & METHODOLOGY

Introduction

As previously discussed in the chapters, the main focus of the present study is vocabulary learning and retention in relation to gamification. In this chapter, the researcher discusses the methodology she used to conduct the present research. By writing this thesis, the researcher seeks to understand the effect that gamification has on vocabulary learning, specifically whether learners' ability to retain vocabulary is enhanced when gamification elements are applied in EFL classes. The choice of the topic is motivated by the fact that learners often struggle when faced with a bundle of vocabulary they have to assimilate throughout their schooling curriculum. This situation pertains to Algerian middle school students in key stage two (second year), where the esteemed second-generation program is deemed to be overloaded. Hence, a gamified teaching approach through the use of Kahoot! application might serve as a boost to vocabulary learning and retention. For a clear understanding of the approach under investigation, the researcher begins by outlining the scope of the study, offering a detailed explanation of Kahoot! As a tool for gamification, the reader can gain insight into the history and various applications of the e-learning platform. The researcher also describes the use of Kahoot! in a classroom context in relation to educational theories and taxonomies. The core element of this chapter is the methodology and procedures. The latter scrutinizes the steps taken during the experiment and the tools that help us answer the research questions. Additionally, information is provided about the participants involved in the study, including MS2 learners, EFL teachers at the middle school level, and the setting. This chapter also addresses the study's design, the instruments used, and the procedures for data collection and analysis.

I. SCOPE OF THE STUDY

It has become an accepted fact that technology is dominating the educational field, and one cannot avoid using any available IT device to access information, assistance, or verification of data. Equally, apps on smart devices serve as an indispensable tool for both youngsters and adults, playing a significant role in various fields such as business, fashion, education, and even cooking. After the COVID-19 pandemic, people found refuge only in online learning. Gamification, being an inherent part of digital technology in education, has become a top priority for teachers aiming to enhance learners' interest and performance. E-learning apps with gamified designs come in various forms and formats, such as Duolingo, Quizlet, and Kahoot. This new approach to teaching has brought about many changes in educational research.

1. Kahoot as a Gamification Tool

Gamified digital learning management systems are strongly needed in today's educational arena. The mindset of 21st-century learners is geared towards high technology and they are constantly seeking more engaging learning environments. Kahoot! is designed to address all types of learners and cater to their learning styles to maximize learning and promote engagement.

A. Key Concepts and Terminologies

The term "*Kahoot*" does not have any pre-existing meaning in English or any other known official or non-official common language. It is considered a neologism or an invented

name in the field of onomastics. The idea's origin traces back to a project called 'Lær Kids Koding' or 'Teach Kids to Code,' with a vision to promote creative and collaborative learning through gamification (Greenberg, 2023).

Kahoot! is a free game-based online response system used by students, corporate trainers, teachers, businesses, and other auxiliary individuals in order to generate fun, interactive and engaging learning experiences. This app is primarily aimed at students aged between 5 and 18 years old (Deignan, 2023). It is used to discover, create, play, and share learning games in various modes: virtually, in class, or in hybrid settings. Users can utilize Kahoot in various ways: playing ready-made quizzes, creating new kahoots, hosting virtual or in-class kahoots, or using it for assessment through student-paced assignments (Kahoot, 2021). Users can also choose to play Kahoots that are available for free or for purchase, either individually or as teams. Playfulness, curiosity, and inclusiveness are the core values of Kahoot's corporate culture.

B. History and Development

The Kahoot! The company was founded in 2012 as a joint project between the founders Morten Versvik, Johan Brand, and Jamie Brooker, and the Norwegian University of Science and Technology. Professor Alf Inge Wang represented the university, along with the entrepreneur Åsmund Furuseth, who provided financial support for the startup. This novel technology was based on a master's research project conducted by the co-founder Morten Versvik. The primary goal of the company was to revolutionize the classroom and create an innovative way of learning. Since its launch in 2013, Kahoot! has been striving to achieve this objective and even surpassed the owners' expectations. Nowadays, people are using Kahoot in businesses, sports, and cultural events (Kahoot, para. 8, 2013). This EdTech (Education

Technology) start-up, headquartered in Norway, has had a unique mission since its inception, as stated by Erik Harrell, "to unlock the deepest potential of each and every learner, of all ages and in all contexts," through games (Chowdhry, 2017). The company Kahoot! was nominated as one of the winners of the EdTech Awards 2020 for its highly appreciated contribution to education, along with other student response systems (Rivero, 2020) & (Kahoot, 2020).

C. Domains of Application

The COVID-19 pandemic caused a shift in learning and teaching. The physical closure of educational institutions suddenly forced the digitization of teaching (Sómer, Moreira, & Casado, 2021). Hopefully, Kahoot! is a useful tool to teach various subjects such as mathematics, science, physics, medicine, and biology (Wang, 2015). This game-based learning platform has succeeded in revolutionizing education worldwide by incorporating game elements into learning, transforming the way knowledge is conveyed and assessed. The number of created quizzes has surpassed 100 million and is growing rapidly, thanks to the active users totalling around 9 billion participants in 200 countries and regions, among which 87% are from the top 500 universities worldwide (Kahoot, 2021). It can be used for in-class teaching, for distance or blended learning formats. The content covers a variety of topics such as movies, music, feasts and celebration days in addition to school subjects in different levels of difficulty and languages like English, Dutch, Portuguese, Spanish, Italian, Norwegian and French. In order for users to explore content, they can filter the option that most fit their learning needs.

D. Educational Significance

Long decades ago, researchers recognized the potential of games and gamification in learning due to the positive outcomes they generate, such as motivation, engagement, social skills (e.g., collaboration, creativity, autonomy), and class dynamics (Hetesi, 2021). According

to the review on Getapp.com's website in 2022, Kahoot! is ranked among the top student engagement platforms (GetApp, 2022). Kahoot also serves as an effective tool for formative assessment. Teachers can assign challenges as homework to their students, who can also design their own challenges and assign them to their peers, all for free.

Additionally, Kahoot is considered a good option for classes with a large number of students, as it can be challenging to engage all learners and evaluate their comprehension and retention of the material. Kahoot can be used in various classroom settings: synchronously by hosting a live session or asynchronously through student-paced challenges. Users can choose the practice option to prepare for upcoming tests through flashcards, games, quizzes, and peer challenges. Kahoot is also quite useful for formative assessment due to its quiz-based features. It is also suitable for both in-class and distance learning (Hetesi, 2021). GSRSs like Kahoot not only improve users' experience in terms of engagement, motivation, and enjoyment but also teach facts and content in an environment characterized by teamwork and peer interaction (Cited in Owen & Licorish, 2020). In a study conducted by the Norwegian University of Science and Technology in 2013 on the use of quiz-based approaches like Kahoot!. According to Singh, Ganapathy, and Lin (2019), students who participated in online quizzes learned 22% more than those who took paper quizzes and expressed satisfaction upon completing the quizzes. Moreover, learners show a preference for Kahoot! thanks to the competitive features it offers, as well as the scoring system displayed on the leaderboard. In a study conducted on the effectiveness of Kahoot! in terms of language learning, Kahoot! Contributed to the improvement of pronunciation skills while learning English (Yürük, 2020). Several studies have reported significant improvements in skimming and scanning skills for reading (Mala, Mustofa, & Sya, 2023), as well as in vocabulary learning, especially during the COVID-19 pandemic (Ramana et al, 2023).

1) Enhancing Engagement

Educators are constantly seeking ways to engage learners in the learning content and environment. Digital technology has succeeded in satisfying this endeavor. The design, sound effects, and gaming features influence learners' behavior in terms of engagement and motivation. Wang et al. (2016) found that the functionalities of Kahoot! could enhance concentration, motivation, and enjoyment compared to other games. Similarly, users of Kahoot! demonstrated higher engagement and motivation while participating in Kahoot-based assessments (Kalleny, 2020). In order to enhance the learning process, educators can incorporate games into their traditional classrooms to increase engagement rates (Wang, 2015). Kahoot was also used as an online teaching and assessment tool during the pandemic, which negatively affected people's interest in learning. The shift to remote modes of study was detrimental to both students and educators. The study included chemical engineering students who attended online lectures and performed regular courses namely Kahoot! quizzes. The results showed that the platform diminished learners prejudices regarding online learning and recommend its use in all the subjects (Sómer, Moreira, & Casado, 2021).

2) Active Learning

Active learning is an approach in which educators actively engage students and empower them to take responsibility for their own learning through discussions, problem-solving, and creation. According to the Center for Educational Innovation, educators use gamified platforms like Kahoot! as a strategy to engage learners in collaborative learning, allow them to reflect on their learning through progress tracking and feedback (2023). In a literature review, Wang and Tahir (2020) investigated approximately 93 qualitative and quantitative studies on the impact of using the digital game-based platform Kahoot! whereby the majority

of studies argue that using Kahoot! has a positive effect on learning performance, classroom dynamics, students' and teachers' attitudes and perceptions, as well as student anxiety. However, a few studies indicated little or no significance in using Kahoot!. Studies have reported that computer game-based learning has a positive impact on language acquisition, especially vocabulary learning, as well as increasing motivation and engagement. However, limitations occur at the level of lower student concentration, inappropriate game choice, and teachers being unwilling and anxious about using computer learning due to their unfamiliarity, which is not the case with mobiles and SRSs (Wang & Tahir, 2020).

3) Immediate Feedback

Needless to say, tracking learners' performance with reported data after completing a quiz is quite helpful in formative assessment. Immediate feedback makes assessment easy and flexible. It helps teachers identify the elements that need to be reviewed, especially after a pulse-check (Ruffcorn, 2021). Other teachers use Kahoot as a tool to predict students' performance in the long run and adjust learning to match learners' comprehension and retention rates (Maurício et al., 2022; Figuccio & Johnston, 2022). The mechanism of immediate feedback benefits learners as it provides information about the quality of their learning and allows interaction and timely corrective action between learners and their educators (As cited in Kalleny, 2020). Ismail et al. (2019) argue that "formative assessment is most effective when it is embedded in teaching and learning activities to facilitate the provision of ongoing, timely, specific, and actionable feedback to students" (p. 1). So, unlike summative assessment, formative assessment improves learners' performance and promotes active learning because it makes use of instant feedback. Learners use immediate feedback to adjust their behavior and adapt their own learning (Walker , 2011).

4) Assessment and Performance Tracking

It is believed that paper-based quizzes can generate anxiety among students, which could potentially impact their test results. Technology-based assessment, however, is thought to be less stressful compared to pen-and-paper testing. Wang et al. (2016) also conducted a study on this topic and concluded that Kahoot functionalities and other game-based assessment tools lead to higher levels of concentration, engagement, and interest compared to traditional quizzes, despite similar results from both methods. Education institutions of all levels implement Kahoot challenges for assessing understanding and tracking performance (Cambridge, 2023). Other studies have also reported improved performance and motivation when using student response systems like Kahoot. For example, (Jones et al 2019 and Aidoune, Nordin, & Singh, 2022) conducted a descriptive study on Kahoot. The argument was made that this platform could improve student performance in learning English.

5) Motivation and Competition

Kahoot! founders thought of releasing the challenge feature by 2017 (Khalidah) so that teachers assign homeworks with more flexibility. The competitive nature that characterises Kahoot challenges keeps learners hooked to the learning experience. In a quasi-experimental study conducted by (Wang, 2015), it was hypothesised that learners' motivation, engagement and concentration might fizzle out after five month of frequent use of the app compared to excitement experienced at the first use. Surprisingly, learners positively perceived the competition feature and wished to use Kahoot! more frequently in learning other subjects.

Thanks to smart connected devices, learning can occur anywhere and at any time; student response systems like Kahoot allows for collaborative learning through the team mode where a group of learners participate in any kahoot as one team either in class or remotely. Gamification

and game-based learning that characterise asynchronous learning enhances engagement amongst participants since everyone wants to play which promotes collaborative interactive learning (Kalleny, 2020). Students are more likely to remain active in an educational activity where they feel as players rather that classmates. This allows for slow or shy learners to take part in social settings different from traditional class where they fear speaking in front of their mates. Additionally, McLoughlin and Lee 2007 belive that using technology in education requires a new pedagogy that harvest the benefits of sharing, heterogeneous communication and social networking (As cited in Wang, 2015, p.15).

E. Pros and Cons of Kahoot

Countless assets are attributed to Kahoot, which justifies the increasing number of users each year. Getapp website conducted a survey to investigate users' views on the positive aspects as well as the shortcomings of Kahoot! whereby users mentioned their satisfaction with content and dissatisfaction with some technical issues like design, (Getapp, s.d.). other cohort studies agreed on the usefulness of Kahoot in educational milieu (Tatas, Anggraheni, & Yogatama,, 2022), especially while learning vocabulary of languages like German (Chumairok & Ardiyani, 2020) and knowledge retention (Owen & Licorish, 2020). Focus and attention are one of the assets assured by Kahoot! (Licorish, et al, 2018)

For the purpose of the current study, the researcher developed a concise table on the advantages and disadvantages of Kahoot in relation to TPACK modal. In what follows a table illustrating the aforementioned aspects of Kahoot with reference to Technology, Pedagody and Content which is sought by teachers upon choosing any learning app.

Table 3.1:

Pros and Cons of Kahoot! Based on the TPACK Model

	Pros	Cons
Technology	-Easiness of use. It can be used on any platform (android/MAC IOs..etc) -users can access content and play quizzes without registration or account sign-up. -in case not all learners afford the device in class, they can use the team mode on shared devices	- student can't see the questions on the screen in classroom sessions where students might press the wrong answer colour unless the teacher ticks on the show-question option - it requires training for the creation of advanced content -if one presses the wrong answer there is no option to confirm or affirm the choice - it is vulnerable of spam attacks -it requires internet access -higher cost in terms of devices and internet access.

		- The design is childish and might not be suitable for academics - Unfamiliarity: teachers should be technologically adept or open to trying new ones - Users cannot access Kahoot without internet
Pedagogy	- Usefull tool for formative assessment - Cultivate engagement, motivation and interaction - Learners can be masters of their learning through research, creation and design of personalised quizzes - It provides instant feedback and generate custumized content review quizzes to learners - It brings fun energy and engagement to the class	- It could be a distracting tool to some leaners - It does not encourage kinaesthetic - Short attention span of students

	- It is suitable for hybrid learning where learners learn at their own pace and teachers receive their performance in real time - Can be used in synchronous and asynchronous learning	
Content	- Availability of content in any subject -Giving students the chance to design their own quizzes and share them with their peers which is highly encouraged by bloom's taxonomy. - Rich question bank for busy teachers who are in hurry or have long content to create; they refer to questions generated by Kahoot. - Teachers can duplicate an existing content and make changes according to the class's needs	- Content is found in few languages - Unavailable translations or subtitles - Limited students number in the free version to 40 participants only.

Eventually, any game-based student response system (GBSRS) or learning platform has limitations. Learners might experience what is known as the wear out effect after the continuous use of Kahoot! (Singh, Ganapathy, & Lin, 2019). The wear out effect is defined

by (Craig, Sternthal , & Leavitt, 1976) as "the occurrence of a decrement of a recall in a message while the message is gaining a higher level of exposure or practice" or loss of effectiveness with repeated exposure (East, 2003). Hence, a repeated use of technological tools in the class often and over a long period of time, will result in a decay in learners' motivation and engagement. Yet Wang (2015) conducted a study to evaluate the differences between single use and frequent use of Kahoot!. the quasi-experimental study included 126 subjects in a university course and it was concluded that frequent Kahoot! deployment over a period of five months did not result in a significant wear off. The sole change occurred at the level of game dynamics, where the group of students who used Kahoot! once interacted more and appreciated the fact that they played all in one setting (Wang, 2015).

F.   Kahoot in the Educational Context

Kahoot! allows the creation of quick user-generated quizzes that other users can play, share or duplicate according to their needs. To amplify engagement, users can also add videos, images or diagrams for a more interactive appealing content. Teachers and learners use it for knowledge and assessment purposes, or by companies who wish to do trainings, team building or corporate presentations. Even families and friends can use this platform in order to create dynamic learning environments in their respective domestic places.

Basically learners are not required to create an account to study via Kahoot!. once the app is set up on the smart device or accessed through an internet browser, user can directly insert the pin code provided by the instructor to join interactive lessons in class, virtually or in hybrid format. In case of autonomous play, user can discover and choose to play amongst bundle of available public quizzes in any subject; either for free or on purchase. Kahoot! is

playable on digital platforms such like projectors, interactive whiteboards, screen monitors or smart phones and remotely through platforms such as Zoom (Sinnivasagam & Hua, 2023)

Teachers however need to create an account to create content or use an existing material available in Kahoot! library. Upon creating an account, teachers choose the user status and for what is he going to use the app whether teacher, business or school; schools and businesses can register as a faculty where all the participants access the app in the name of that school or business.

In order to create true/false or MCQ quizzes, teachers opt for the free basic version. Alternately, teachers might need advanced features such as like uploading videos and sound recording, slides, polls…..etc. These features are available in the pro and premium version for extra registration fees. All the content generated by the teacher is stored in the library and can be put to public for other users to benefit from for free or on purchase. In classroom context, the teacher displays the quiz on the screen and provides the code to learners to join in single or team mode. Each quiz is timed, the question appears on the screen while learners answer on their devices. When time is up, the correct answer appear on the screen and a leaderboard with top five players. Another possible option to play the quiz is the challenge, where teacher sets the quiz as a homework with a deadline and provides learners with a code. Upon completion of the quiz, the teacher simultaneously receives a timely report of learners' performance that details the difficult questions and even the questions that took longer time to be answered. This report can be downloadable in excel format.

Learners who are assigned the homework receive notification as a reminder on their devices before the deadline in case they didn't do the assignment. Before doing the quiz, they have the practice option to review and revise the content in flashcards. In case the quiz was too

difficult, they can replay the quiz but only the questions that were wrongly answered. Learners receive points for each played quiz and they can see their placement amongst their mates who played the same assignment. It is recommended that students insert their real names instead of nicknames so that teachers keep track of each one. Kahoot assignment is known as a challenge rather than homework to motivate students to perform their tasks. For content creation, teachers have to go to www.kahoot.com, whereas students who want to joinf an assigned kahoot! , they have to press the join button on their devices or go to www.kahoot.it to insert the code.

In addition to the learners' performance report, there is the 'Stats' option which gives you an overview of the created Kahoots by the teacher, including the number of players who played and shared those kahoots and how many times they have been played.

G. Alternatives to Kahoot

E-learning platforms fall under the label of Portable Assisted Language Learning (PALL), student response systems (SRS) or (Game-Based SRS), class or audience response systems, personal response systems or electronic response systems (Wang, 2015). These are many labels but the finalty is the same; digitalizing learning for better engagement and motivation as well as improved learning outcomes. Many are the brands for these learning SRSs and they all compete to create a more appealing competitive gamified content to a large number and type of audiences and consumers. Kahoot! is but a drop in the ocean of e-learning systems.

 In a digitalised commercial era, many are the digital learning products that cater to people's educational needs. In order to be able to find the right alternative to Kahoot, there are many criteria to be taken into consideration. The most common selection criteria used to define

the functionality of an e-learning platforms are 1-learning management 2- learning content management and 3-communication and collaboration tools (Baggia et al, 2019, p. 53). These criteria will help the user choose the platform that is most suitable to his/her needs. Hence, defining the learning needs and objectives facilitates the choice of the platform. Flores (2015) suggested some characteristics a game should have; such like points, levels, badges, avatars, performance graphs, progression, quests/challenges, social elements/community collaboration, discovery/exploration, rewards, achievements, epic meaning, and leaderboards (Hetesi, 2021). SRSs that are akin to Kahoot! share quasi features such as quizzes, competition, scoring system, levels, flashcards, leaderboards, coins…etc. Amongst these alternatives are Socrative, Quizlet, Poll Everywhere, Learning Catalytics, Buzz, iCliquer and School Quizz …etc (Wang, 2015). **(See table 3.2)**

2. The Mechanism and Requirements of Kahoot!

Working with kahoot! is an experience that is akin to integrating computers and data projectors in teaching decades ago. Adopting a novel technology in teaching and learning needs certain awareness, readiness and competence on behalf of educators and learners. These stakeholders should be aware of the artefacts of the new technology, express openness and readiness to venture in this experience and demonstrate or show some degree of knowledge and competence in terms of use and usage. Hence it is necessary to highlight the required components in order to understand the mechanism of Kahoot and use it effectively. For the purpose of our research, the reader would be more interested in a guideline for teachers and learners on the working of the app, its features, how to use it and the required skills for an effective application. We shall tackle this point by referring to two requirements namely technological artefacts and technological acceptance:

Table 3.2: Comparative features of some e-learning platforms

Alternative apps	Common criteria/ features/ categories						
	Assessment	Microlearning	Student engagement	Gamification	Reporting analytics	PPT integration	Language
Classcraft	x	**x**	x	x			
Quizzlet	x	**x**	x		x		
Socrative	x	**x**	x	x		x	**14 lang**

A. Technological Artifacts

After the COVID19 pandemic, it has become a valid truth that all participants in education should be equipped with the least technological tool made available. After the lockdown, teachers were faced with the harsh reality of digitizing education where they have to teach exclusively online despite the obstacles of redesigning courses, maintaining students' interest, time management and increased online cheating in exams (Cited in Sómer, Moreira, & Casado, 2021, p.21). Further, Internet access is considered the motor of 21st century digital education; without which learning cannot occur fruitfully. Nowadays, pen and paper are not qualified to assure the sustainability or the traceability of information. Sustainable lifelong learning is the core pursuit of quality education that is part of the 17 sustainable development goals (UNESCO, 2017). Smart devices and internet are gears to lifelong sustainable learning. On the one hand, schools should afford suitable equipment for distance and virtual learning synchronously and asynchronously in addition to upgraded software and platforms for teaching and assessment. Teachers and learners on the other hand need smart devices and browsers that enable them access to learning platforms in school setting and hybridly via their accounts on digital platforms. Additionally, curriculum and syllabus designers need to consider adapting content

to the current digitalized era. Wang (2015) argue that "Essential requirements for the platform was that it should be straightforward for teachers to create own content, play quizzes and assess the students, and for the students to join without need to register, play without embarrassment (anonymously), have fun, be competitive, and learn"

B. Technology Acceptance

As discussed earlier in the first chapter teachers as well as learners should be techno savy so that to be able to use Kahoot!. despite its friendly interface, using kahoot requires certain autonomy, flexibility and curiosity which characterises a person who uses technology. Applying digital technology in classroom setting requires training and some prerequisites in terms of creating accounts, creating content, submitting answers …etc. a technophobe would have to attend trainings and show some openness to try new teaching methods. One of the 21st century skills needed in education is to be digitally literate and be updated about new trends in technology that make life easier and more practical.

We will tackle the readiness of teachers and students to use kahoot with reference to the Technology Acceptance Modal (TAM) model. TAM is the most widely used framework to predict the acceptance of a new technology. TAM or the Technology Acceptance Model is a framework developed by (Davis, 1989) and which is based on two key factors affecting users acceptance of a new technology. These two constructs are known as the perceived usefulness and the perceived ease of use and they are the 'determinants of system use' (**figure3.1**). In other words, adopting a digital solution depends on how users think of its use and utility. Firstly, perceived usefulness is defined by (Davis, 1989) as 'the degree to which a person believes that a particular system would enhance his or her performance' (p.477). This means that a user would not invest his time or energy in an application unless it would benefit him or it would

have a strong   Davis hypothesised that the

usefulness of a system does not determine its use; as a useful software might be hard to use.

Hence, he added another factor which is the easiness of use being it 'the degree to which a

person believes that using a particular system would be free of effort or free from

difficulty"(Davis, 1989, p.2). Users often accept a system that requires less effort and easy

manipulating. Motivation, ease of use and usefulness perceived by users impacts the quality of

training and the creation of conductive study environment (Toma , Diaconu, & Popescu, 2021).

There is a strong correlation between these two constructs, users favour an application over

another depending on performance and difficulty. The scale developed by Davis helps users

rank the usefulness and easiness of a system and eventually decide whether to accept or reject

the said system.

Figure 3.1:

Technology Acceptance Model (TAM)
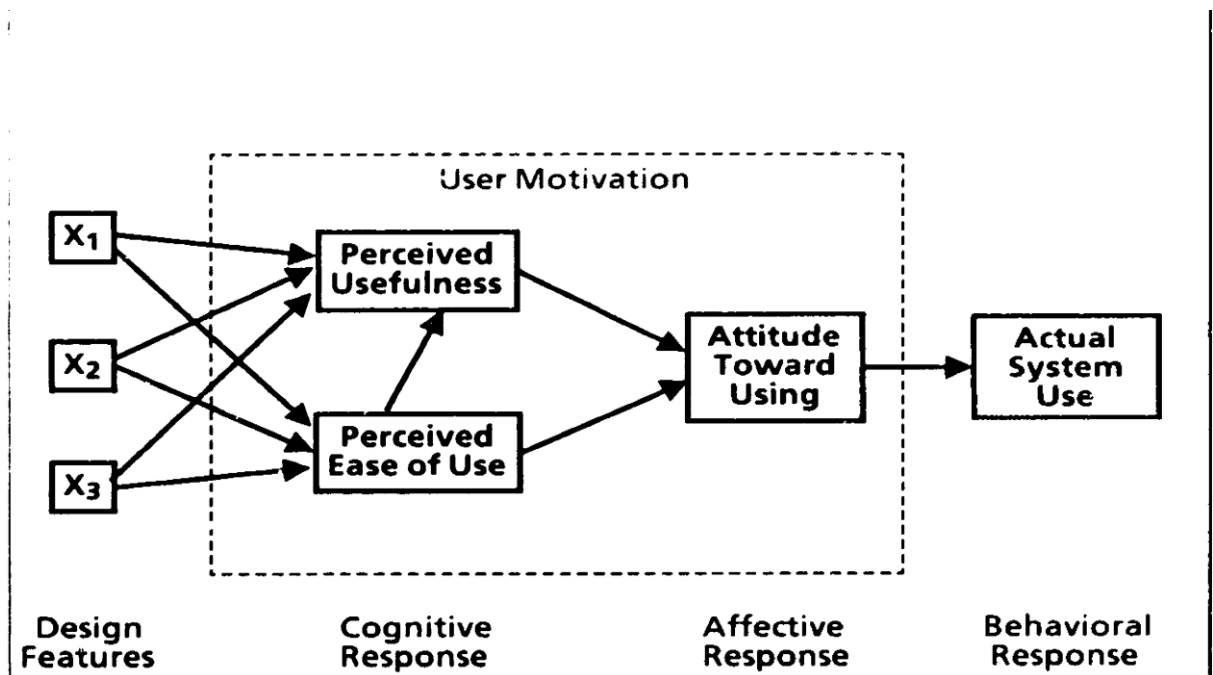
Note: Reprinted from (Davis, 1985, p. 24)*.*

In the present case, unless thechno-phobe, teachers and learners perception of kahoot! usefulness and ease of use determines their openness and readiness to use it in the classroom context. The features characterising this platform must fulfil these two requirements in order to improve the quality of education. Else, Bradford-Networks, (2013) attributes quality and varied interaction in the classroom, class dynamics, student and teacher perceptions and performance to the technical infrastructure of the schools as well as the digital devices of the students and their ability to use SRSs (Cited in Wang & Tahir, 2020, p.7). For an effective kahoot! use it is important to have good and permanent internet connection, needed to display and play the quizzes in addition to patience and high, constant attention (Toma , Diaconu, & Popescu, 2021).

C. Starting from Scratch

Learning, playing (gaming) and assessment features are included in the better part of e-learning platforms and Kahoot! is no exception. These features that characterise Kahoot! are scrutinised below in details:

1) Player /user types: the app is available on Microsoft Windows, macOS and Android, or direct access using browser viz, Mozilla Firefox, Google Chrome, Internet Browser, Brave…etc. Once the app is loaded, four user types are disntinguished: Student, Teacher, Professional and schools.The platform can be accessed through downloadable smother workflow apps on smart devices or via websites. For the creation of content, users go to www.kahoot.com or to the link: https://create.kahoot.it . For students to play the assigned quiz, they do so on www.kahoot.it where they directly insert the code pin and play. Students insert the code pin or the URL link of the quiz provided by the teacher, create nicknames and choose emoticons to be displayed as players.

Figure 3.2

Subscription Options
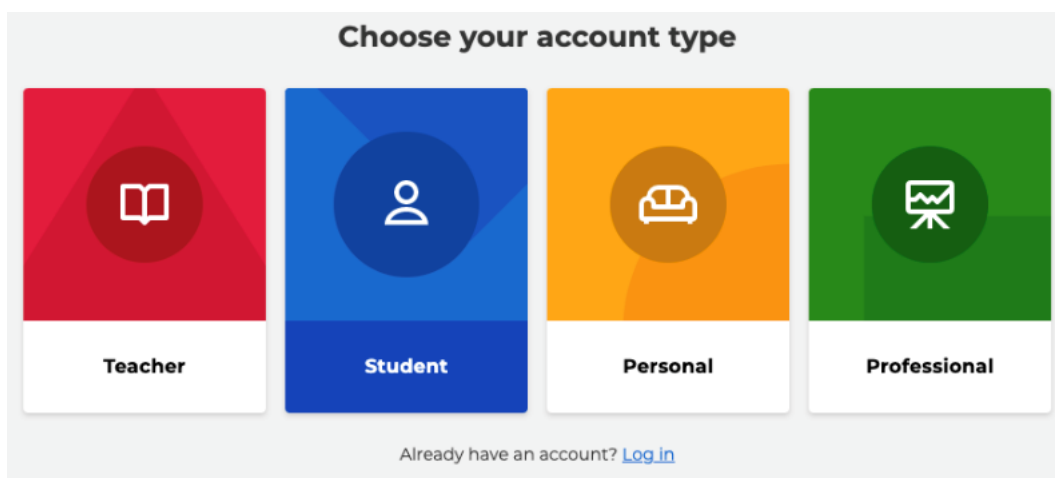
Note: Reprinted from (Kahoot, 2021)

2) Subscription options**:** it is to note that accessing kahoot does not require an account, yet to discover and create more content, it is advisable to subscribe. Three options are available:

1- *Free***:** this option does not require payable access. It is a basic version through with users play attributed or assigned kahoot to them, discover free quizzes and create new basic quizzes. It hosts up to 40 players and include true/false or MCQ quizzes.

2- *Pro***:** this plan requires a monthly or annual payment. It permits up to 200 player and 5 teams and the content comprehend more options than the free version.

3- *Premium:* requires monthly and annual payment. It permits up to 400 players with more sophisticated question and answer types.

The above-mentioned options appear with different fees depending on the type of users whether student, teacher or schools.

3) Game mode**:** teachers teach with kahoot in classroom setting with a bigger shared screen displaying quizzes while students answer on their devices. They can also host a live kahoot through videoconferencing for distance learning through zoom, Google meet or skype.

A third option would be that of student-paced or self-paced challenges which is also perfect for blended learning; teacher assigns Kahoots by providing pin codes, QR code or URL links and students practice at their own pace any time anywhere convenient to them with questions and answers displayed on their devices. The teacher can set deadline for the completion of the assigned kahoot; after the due date, students cannot access the challenge. .(**figure3.3**)

Figure 3.3:

Setting an Assignment for Homework

Note: Reprinted from (Kahoot, 2021)

In self-paced challenge, accuracy is favoured over speed i.e the teacher locks the timer so that learner focus of giving correct answers rather than giving quick answers. Moreover, students can play the assigned kahoot in single or team player mode or choose the study option to review content in form of flashcards, practice ot test formats. The study option is helpful for revision and practice of content of the game before playing it.

4) Play mode or study modes**:** this feature is more applicable to students (and other users) for study purposes either when they are assigned kahoots by their teachers or when they discover content themselves. In self-paced learning, students can access and play kahoots in two ways; as a **single** player or in **team**. For single study purposes, three methods are available; **flashcards**, **practice** method without score or timer and lastly the **testing** method with timer and score. Student-paced mode of learning is useful for content review, exam preparation and homework assignments. For **virtual study groups**, students can create and join leagues to study in competition-based format. Group members add kahoots to the **league** and engage in collaborative content research.

Kahoot for schools provide a more particular personalised feature for distance learning. This personalized feature customizes learning according to each learner's pace and level of understanding and assures better knowledge retention. In a live kahoot, students usually err or take longer time to answer some questions. These questions are saved by the app for later practice i.e after the live session with the teacher, students replay the difficult questions at their own pace. This technique of spaced practice is repeated in 7 days rounds until full mastery of the missed content.

5) Question types:

Users and teachers in particular can choose from 50 million available kahoots or create new ones. There are seven question types available in the free and paid versions of Kahoot, explained in the table below:

Figure 3.3:

Different types of Kahoot! subscription

subscriptio n	N°of participan t	True/fals e	MC Q	Image answer s	Puzzl e	Pol l	slid e	Typing answer s
Free	40 players	X	X					
Pro	200 / 5 teams	X	X	X	X	X	X	
Premium	400 players	X	X	X	X	X	X	X

Content can take different forms; **true/false** questions, **MCQs** or **basic slides** which applies to the free basic version of kahoot. In addition to classic slides, teachers can use **advanced slides** to present content and questions in a more creative way through added animations and motions or via **audio questions**. The latter is quite beneficial in listening and reading aloud for language learning. This feature is available in 37 languages (Kahoot). For a more advanced content, an optional upgrade helps unlock other question types such like **puzzle** to arrange answers in order, **poll** to gather feedback, **slide** to present data, **typing answers** in short texts, open-ended questions to type up to 250 character answers, **word cloud** to collect poll responses in form of word cloud and last **brainstorming** ideas for discussion. Polls, open-ended questions and brainstorming are key features that enable students the possibility to reach the highest level of Bloom's taxonomy which is creation. A combination of several question types in one kahoot, create dynamics in class and activate different ways of thinking (Kahoot). One of the features of Kahoot! is the question bank which appeared in 2019. The question bank gives autosuggestions from 60 million public kahoots. While the teacher starts typing,

make up on the ungraspable content. These reports are downloadable in spreadsheet format .

Moreover, the teacher may have a look at the time spent answering questions and which were

difficult to answer. If more than 35% of students answered incorrectly, then the questions would

be labelled difficult (Kahoot, 2021). These difficult questions are grouped together by the app

to be replayed by the students who could not successfully complete the questions; each learner

receives personalised quiz with the questions he judged as difficult.

Figure 3.4: Learners' performance Report in xls format.

3. Gamification Characteristics in Kahoot

Needless to say that gaming is the trendiest and most adopted mode so far. People of all

ages and particularly students seek solutions that inhibit gaming mechanics and dynamics to

add more fun and enjoyment to their everyday lifestyle and get out of the comfort of traditional schooling. (Concannon, Flynn, & Campbell, 2005) attributes this shift to education technology to constant changes in innovation technology, educational delivery market conditions and the demographic factors of students (As cited in, Park, 2009). Learning Management Systems and e-learning platforms like Kahoot! offer a game-like interface that appeal to learners. This platform includes most if not all gamification features since the app is constantly updating its gamification characteristics to satisfy its audience. the game mechanics for instance include are: rules, points, timer, leaderboard, single and team mode player, levels, achievement, badges to name few. Moreover, kahoot! also employ some game dynamics to make learning more gamely and engaging such as challenge, competition, avatars, exploration, collaboration, sound effects and freedom to win or loose. Studies also focused of Kahoot's varied delivery methods like pictures, videos, misic, scoring and ranking as well as the psychological benefits it generates (As cited in, Wang & Tahir, 2020).

4. Strategies for Effective Kahoot! Session

There are many a ways teachers can try in order to benefit from Kahoot! As much as possible. Some active learning ideas include but not limited to icebreakers or warm-ups, brainstorming ideas before starting a lesson, retrieval practice to help students recall information and make new connections with previous knowledge; which strengthen long-term memory, self-challenging quizzes and finally yet importantly, have students create their own kahoots to boost their creativity and knowledge retention (Durhamcollege, 2023). In the arena of language learning, learners can play different kahoots related to vocabulary practice, punctuation activities, pronunciation review and grammar checker and corrections. Other

attempts went even further to apply Kahoot! for narrative texts and it proved to be effective and well perceived both from teachers and students (Rafidiyah, et al, 2022).

For a successful application of Kahoot, it is important to have good internet, planning the steps ahead of the lesson and inform students of the play mode in order for them to be ready and gain time. As a starter to brainstorm ideas, icebreaker or a warm up, kahoot quiz is a quick and fun to begin a lesson or a unit to talk about the key facts and concepts. (Abebe, s.d.). games can be a substitute for tasks and exercises and giving the opportunity to the teacher to monitor in a learner-centered setting (AS cited in (Wang, 2015).

Kahoot! and other cohort are a to-be-mastered e-learning tools; any individual would at a given time browse one of these platforms whether for academic or professional edeavours. Ergo, there should be a certain level of digital literacy which is at the core of the 21st centuary skills. Otherly said, if one is a technophobe or is not curious enough about trying new –not to say trendy-technological means to facilitate tasks, he would probably miss opportunities or might even stay behind those who excel in their arena.having the necessary knowledge and skills needed to utilize technology effectively for a particular purpose is referred to as digital fluency or digital literacy (Briggs & Makice, 2012). Individuals are categorized by (Çelic & Kokoç 2020) in accord to their digital proficiency into a typology of three, namely those with no digital skills, others who are digitally literate and lastly those who are digitally fluent. Learners and teachers alike must acquire digital competencies as it a priority in a digitalized educational era. Teachers who are digitally skillful can assure high quality content that can be effeciently delivered. Equally, users who want to benefit from all genres of content available on various platforms need to be technologically fluent and savy so as to be able to access, analyse and use the digital content.

5. Assessment and Evaluation

This technology-enhanced active learning strategy can be used as a tool for online assessment and evaluation. As stated by the Analytic Quality Glossary, "Assessment of student learning is the process of evaluating the extent to which participants in education have developed their knowledge, understanding and abilities". Course designer can formatively test learners' performance and check their understanding and comprehension rate of the taught content with a detailed report of the learners' performance data analysis. Additionally, kahoot! can help diagnose users' prior knowledge of a given subject and as homework assignments. However, kahoot! is not thought to be suitable for summative assessment (Croft, et al, 2023), this fact could be due the main finality of the app which is to engage learners through gaming and very scarce studies have tackled the functionality of assessment via kahoot!. cohorts findings reported significant impact of online formative assessment including gains in learners performance, achievements scores, and the development of complex cognitive processes like self-regulation (Cited in, Wang & Tahir, 2020). Other studies investigated the use of regular quizzes such as that of Kahoot! and compared the results with the final exam scores. The results indicated that exam scores were related to those of kahott! regular quizzes. The latter helped to predict leaners' difficulties and lacunae beforehand so that to remediate and plan corrective actions (Sómer, Moreira, & Casado, 2021). Conversely, other studies reported higher enjoyment rated but no significant or noticeable difference between Kahoot! quiz scores and regular test scores (Singer, 2016).

As a result, this SRS Kahoot! is approved by many studies that it affects users perceptions, their engagement and motivation, class dynamics, concentration and enjoyment which explains why –since its release in 2013- around 2.5 billion used it in about 200 countries in the world by 2019 (Wang & Tahir, 2020).

II. METHODOLOGY

Overall, many researchers attribute positive effects to gamification. The latter is believed to increase motivation and the quality of learning. Other findings fairly show a contradictory opinion. On one hand, some researchers argue that there is no significant difference between gamified and traditional learning in terms of performance. On the other, extrinsic motivators like rewards, virtual currency, and badges may reduce the intrinsic motivation of learners. One major factor affecting those conclusions is the fact that gamification is still an undiscovered area of research; mainly with regard to second language learning. Moreover, Unexhaustive number of research are made to shed light on what feature of gamification affects which aspect of learning. As such, it is important then to extensively analyse the moderating variables in order to arrive to well-grounded conclusions.

1. Research Design

A. Type of Research

In educational research, a study might take a naturalistic design that describes a setting in its ongoing natural process, or through an experimental design by evaluating the impact of an educational intervention on a particular learning outcome (All, et al, 2014). This research is quasi-experimental, mixed methods action research, which aims at exploring the impact of gamification on learners' performance and their teachers' perceptions. The mixed methods approach better suits research cases where other methods have limitations (Ivankova, 2015). In this section, the researcher will describe the design, the process, and the relevance of the research. The present study is quasi-experimental in nature. This type of study permits the

researcher to establish a relationship of causality between variables and to manipulate the condition in which the teaching learning process is undertaken. The quasi experimental design enables a comparison of a treatment group that receives vocabulary learning lessons using gamification and a control group who attends traditional vocabulary learning sessions. The purpose of using such type of research is to find out whether gamification is impactful and helps with vocabulary retention.

The present study attempts to comprehensively investigate gamification effects on learners' capacity to retain vocabulary while making use of the e-learning platform *Kahoot!*. The study aims is to answer the following research question:

To what extent does gamification affect the language learning environment in terms of vocabulary retention?

In order to answer the aforementioned research question, a set of sub-research questions are taken into account and they are as follows:

- What is the impact of gamification on learners' ability to memorize vocabulary?

- What effect does gamification have on vocabulary learning?

- What benefits does the gamification tool Kahoot! offer to the learning environment?

- What are the attitudes of teachers towards gamification in general and specifically towards Kahoot!?

To address the research questions mentioned above, the following hypotheses are formulated for investigation:

- Gamification contributes to some extent to optimizing vocabulary retention.

- Game mechanics can enhance learners' engagement and performance in the classroom.

- Kahoot, as a gamification tool, could facilitates learning in a digital environment.

- Both learners and teachers might have positive attitudes towards gamification..

In order to conduct the present research a quantitative methodological framework is required through the use of post-test and delayed post-test, fortified with qualitative methodology through teachers' interview and class observations in order to evaluate the gamified environment and back up the findings.

B. Rationale for Choosing the Design

It has become common sense that integrating game elements into any environment of work or study is significantly important to change behaviour and improve performance. Teachers as well as learners often fail to find interest in a particular subject; traditional teaching methods are no longer appealing and are judged to not yield positive outcomes. As argued by (Prensky, 2002); amongst the main issues with all formal education is to keep the students motivated enough to stick with the learning process. According to Pellegrini (2009), teachers and material designers sought refuge in a combination of playfulness and technology, because Play continues to be widely acknowledged as an essential means through which young children learn and develop cognitively as well as socially (As cited in Chee, 2016, p.5). Furthermore, technology is used as a helping tool to facilitate learning compared to the traditional way of teaching (Zou , 2022). Hence born the notion of gamification in the sphere of education and language learning in particular. Gamification as a field of its own is a novelty, but its building principles of game mechanics and dynamics are unintentionally used in almost all of the domains. Gamifying education has countless virtues such as the enhancement of engagement

and motivation, increase of attention and focus rates, fostering achievement and progress through feedback and reinforcement, and lastly boosting active learning and recall .

The rationale for conducting the present research stems from learners' growing interest in games and from teachers' endeavors to respond their need by incorporating game elements into the educational settings. In the arena of language learning, vocabulary acquisition is indeed crucial; the amount of lexis actively employed by learners lays the foundation for effective and comprehensive communication. When investigating the effect of gamification on learners' memory, the findings will contribute to the existing literature on pedagogical innovations in language learning; yielding insights related to the potential advantages of gamification for vocabulary retention and recall as well as informing educators and curriculum designers about effective strategies for better vocabulary retention. Eventually the study has of an objective to bridges the gap between the impact of gamification on learners' performance in the existing literature and the practical implementations in the educational context.

2. Participants

A. Learners' profile

Two groups took part of the experiment, a control group and an experiment group. The latter received the treatment, and whose results were compared with that of the control group who did not experience the treatment (see **table**4). Participants were randomly selected and they were second year learners who are novice learners of English and whose first experience of English language learning was in the first year of middle school. During the school year 2022-2023, there were 6 groups of second year middle school and two of them; namely 2m1 with 38 learners and 2m2 with 36 learners; the 'm' in 2m1 and 2m2 stands for middle school. They were grouped based on their high or average grades compared to the other four groups

that were outnumbered and included good as well as slow learners. As such both groups were pre-selected by the administrative board of the school based on certain criteria including but not limited to performance and learners grades throughout the precedent school year 2021-2022. The researcher was interested in the groups 2m1 and 2m2 because of the criteria of the research. The main criterion was familiarity with the language based on their assessment grades. Participants have beginner level of English language mastery. As a matter of fact, the design of the first and second year middle school program of English is vocabulary-based where learners acquire as much vocabulary as they can along with basic grammar in order to introduce themselves and describe their surroundings. Other criteria for selection include: familiarity with ICTs chiefly smart devices (ipad-mobiles..etc), awareness about learning platforms not necessarily Kahoot. MS2 learners attend 3 hours English classes on a weekly basis; 2 lesson hours and 1 tutorial session where learners are divided into two groups of French and English class.

Table 3.4:

Participants in Control and Experiment Groups.

	Number	Male	Female	Age
Control group	35	15	20	11-15
Experiment group	35	13	22	11-16

The experiment group engaged in vocabulary learning sessions that incorporate gamification using Kahoot! App. These gamified activities take the form of quizzes that use the scoring system, rewards, progress bars, level tracking, leaderboards…etc. These quizzes take the form of MCQs, true/false questions, polls, puzzles, open questions…..etc. The control

group however, received traditional vocabulary listening lessons that are not gamified but use text-book, flashcard and a speaker for the audio scripts. Additionally, the teacher prepared a video for the participants as a tutorial for the learners since they are not familiar with kahoot!. The video illustrates how to insert pin codes in class and how to search for other content related to the school syllabus.

B. Teachers' profile

Prior to the main study, the researcher made a situational analysis for the purpose of investigating Algerian EFL teachers' opinions about gamification as a new strategy in education, particularly the actual implementation of gamification and game mechanics in language teaching through ICTs. For this aim, the researcher conducted a semi-structured interview with 110 Algerian teachers of English from different middle schools in Algeria (**table5**). The interview took place at the end of the school year 2021-2022; more precisely by mid-July. They were experienced teachers aged between 25-50 and whose years of experience range from 5 to 25 years of teaching. Through the interview, we sought to explore teachers' attitudes, awareness, and competence vis-à-vis gamification and explore the arena of English language teaching through e-learning platforms. The participants were selected through snowballing based on certain criteria. teachers of English at middle school who use game-based teaching, ICTs, e-learning platforms, and mobiles while transmitting knowledge. The selection of participants took several steps. First a publication on active facebook groups of middle school teachers in Algeria. The post included a survey on what teachers use most in class whether games, ICTs, mobile apps, gamification. Amongst the respondents, those who use ICTs and games were contacted via Messenger to see if they accept to contribute in the study via zoom or through recorded voice-calls. The researcher also contacted a coordinator (inspector) from the city of Setif in order to put him through some teachers who have already applied

gamification as a teaching method. The researcher opted for a written chat on messenger because not all participants accepted the recording of their voices. This interview helped to unveil the arena of gamified language teaching in the eyes of teachers. This step opened the door to the application of gamification in language teaching through Kahoot! which is akin to Duolingo -an example cited by interviewed teachers-

Table 3.5:

Participants of the interview

	Total number	**Male**	**Female**	**Age**
Interviewed participants	110	14	96	25-35

3. Instruments

A. Data collection Tools

The data collection tools used in this study encompassed a combination of instruments that would enable the assessment of learners' vocabulary knowledge and retention and investigate the teachers' perception of gamification in EFL class. These tools were utilised to measure the effectiveness of gamification to improve learners' capacity to retain vocabulary through Kahoot as a means for applying gamification. The coming description illustrates the tools employed to collect data:

1) Teachers' Interview:

At an exploratory phase and before applying gamification with learners, the researcher attempted to investigate the arena of gamification in the eyes of teachers. Saryono (2010) explains that qualitative research is the choice for investigating, describing, finding, and explaining features, and the quality of unexplained social influences. Accordingly , a semi-structures interview was designed by the researcher in order to investigate teachers' attitudes towards gamification in language teaching.

Three main axes were tackled in the interview alongside the teachers' background namely; teachers' awareness about gamification as a concept and a method, their competence with regard the use of ICTs and e-learning apps in teaching and lastly their experience in applying gamification in class **(Table 3.6)**.

Table 3.6:

The teacher's interview sections.

Background	Awareness	Competence	Experience
Questions 1 to 3: Age, years of experience and the respected city where the teachers teach.	Questions 4 to 8: tackle the teachers' knowledge with gamification and games in teaching	Questions 9 to 12: deal with the competency level while using and applying gamification and digital platforms.	Questions 13 to 17: cover the practical aspect where English is taught through gamification and the constraints to be overcome

The section related to teachers' awareness includes four questions about their knowledge about gamification and game-based learning as well as the application of digital technology in EFL learning and teaching. The second section with four questions tackles how competent they are in terms of digital platforms and the flexibility in choosing the game elements. It is in the last section of experience that the teachers answer 5 questions in order to give more insight on the actual use of gamification alongside the challenges encountered. The overall interview (table…) sheds light on the gamification in the eyes of the Algerian EFL teachers. The interview was conducted by the end of the school year 2021-2022, in a period where teachers completed the program and the correction of exams.

2) The post-test:

The post-Test was administered to both control and treatment groups to evaluate the participants' retention of the taught lexis. After each lesson, participants anonymously were asked to do a test that covers the lexical elements dealt with in class (appendix). Each learner was given a handout with activities related to the lesson content. The post-test of both control and experiment groups was identical and its objective was to test learners' retention rate of the taught vocabulary. The post –test included three activities and learners were allocated 15 to 25 minutes to do it in class and after having packed all of their books and copybooks. Immediately after the test, the teacher collected the test sheets for later correction. Internet access was required to access the application and the researcher had to ensure good quality internet in order to upload Kahoot! application and Kahoot! website. Therefore, he teacher gave access to pupils to use the operator's internet she subscribed for. In one of the lessons, where the inspector had to be present, the headmaster of the school gave an authorisation to use the school internet service.

3) The delayed post-test:

It was administered after almost 4 months and it encompasses identically the same vocabulary items as the post-test (appendix). The delayed post-test was administered at the beginning of the school year 2023-2024; during the fourth week of September. The delayed post-test was not done in the same class nor was it completed at the same time, since the participants in the control and experiment groups were dispatched to 6 different classes of third year. Furthermore, there were participants of control and experiment group in the same class. Other participants failed the year and were found in the second year class. Only one participant from the control group left school.

Both post and delayed post-tests were designed by the teacher and were validated by peers and the inspector for content relevance. The activities included were mostly MCqs,in addition to complete the table, put the right name under each picture as well as writing full sentences.

4) Kahoot

This learning management system is a tool used to design the gamified content taught in class. The teacher created an account on kahoot and paid a premium subscription for one year from October 2022 to september2023. She designed the lessons on the application in respect to the formal framework; PDP for I listen and do and PPU for I practice. The lessons designed were grouped in a course i.e a sequence. In class, the teacher displayed Kahoot screen on data projector and provided learners with the pin code to start the lesson. After the lesson the teacher, give learners another pin code for homework. The homework or the challenge on kahoot was assigned with a deadline; after the deadline learners could not access the homework. Learners on the other hand uploaded the application, but creating an account was not mandatory. During

the class they were provided with the pin code to join the lesson. The learners who could not bring their smart devices, joined the lesson with another classmate in a team mode.

B. Validity and Reliability of Instruments

For content validity, the teacher consulted her respected coordinator (inspector) as well as peer teachers in order to validate the sequence plan and lesson plans designed based on kahoot! requirements. Further, the inspector officially attended one of the sessions in order to provide constructive feedback on the gamified environment. Content validity as defined by (Rusticus, 2014); is: the degree to which an assessment instrument is relevant to, and representative of, the targeted construct it is designed to measure".

1) English at middle school in Algeria

English at middle school target three core objectives; namely linguistic which tackles the mastery of language for communication, then methodological that aims at developing different learning skills and strategies as well as cultural objective to form a future citizen who is self-aware and open to other cultures (Ammour, 2009).

For four years of middle school in Algeria, learners are taught in a way to be able to interact, interpret, and produce meaningful descriptive, narrative, argumentative and prescriptive messages of average complexity through writing and/or speaking. More specifically, learners at key stage one and key stage two i.e first year and second year middle school, should be able to describe objects and places surrounding them in their environment and of their interest. Whereas the exit profile for third and fourth year middle school; narrate and argument applies respectively. Moreover, the exit profile for MS2 is to enable the learner

'to interact, interpret and produce short oral and written messages/texts of descriptive and prescriptive type, using written, visual or oral support in meaningful situations of communication related to his environment and interest' (Education, MS2 Yearly Planning Middle School English, 2021). Hence, to achieve the desired exit profile, learners of second year are required to master as much vocabulary as possible. For novice learners, essential vocabulary along with basic grammar is necessary to communicate in speaking and writing.

2) The taught material

The teaching resource subject of this research is Sequence four, the last sequence of the second year reformed program in 2017; referred to as the second generation. In sequence four of the second year text book entitles '*Me and My Travels*'; whereby learners will be able to write and talk about travelling including amenities, outdoor activities, weather forecast, planning itinerary and narrating a travelling experience (**Table 3.7**). For the said purpose, learners should develop linguistic and methodological skills to be able to express themselves and show their cultural awareness. By the end of the fourth sequence every learner will be able to evaluate his knowledge, attitudes and skills vis-à-vis the learnt material in a quasi-real life integrated situation. Eventually, learners will be able to plan and narrate a travel itinerary. Below is a detailed explanation of the aforementioned sequence including the lesson framework and the learning objective. The sequence plan on kahoot is known as a course with lessons.

The teaching material was taught in a digital setting using smart devices namely mobile phones and in some cases using computers. Before each session, the teacher indicated on the correspondence copybook that learners are asked to bring their smart devices on the indicated date so that parents were informed beforehand. Most participants brought their devices except for few of them who forgot or whose parents refused to give the requested device to their

learners for fear of theft or legal issues/discrepancies. The number of those learners didn't exceed 6 learners.

Table 3.7:

Sequence plan (sequence4 – Second year middle school MS2)

Lesson	Framework	Learning Objective
Initial Situation	**PDP**	Starting off Situation/ Problem solving situation. Learners will get a clear understanding of the key topics related to travel (introduction on Kahoot at the end of the lesson)
I listen and do I **(Kahoot based)**	**PDP**	Learners will be able to interpret an oral conversation about travel destinations and leisure activities task6p109 -additional quizzes for homework
I listen and speakII **(Kahoot based)**	**PDP**	Learners will be able to interpret and use use a street map and talk about interesting sites (travel icons, location, distance ,directions) Post L: Task9 p127 (handouts)
I practice **(Kahoot based)**	**PPU**	SWBAT demonstrate their ability to gather specific information about the weather with a correct use of the future tense
Tutorial Session		Flags currency capital cities

(Kahoot based)		
I Read and do		Learners will interpret a blog post about spring travel plans and an itinerary
I learn to Integrate	**PDP**	Learners will plan a travel journey for a guest from a foreign country using a map to indicate an itinerary.
I think and write	**PDP**	Learners will write their own travel plans for the coming summer holidays

Note: **PDP** (Pre-During-Post) – **PPU** (Presentation- Practice – Use)

At the beginning of each lesson, the teacher started the lesson as usual with a warm up; greetings, writing the date and review of the previous lesson. Then she set the data show on with kahoot screen so that to start the lesson while learners open their kahoot accounts. The lessons taught using kahoot were either listening with PDP framework (Pre listen/ During listen Post listen) or practice lessons with PPU framework (Presentation/ Practice/ Use) whereby all the steps took place on kahoot. The lesson framework on kahoot take the same form as in the traditional classroom. After introducing the lesson, the teacher displayed the pin code so that learners join the session. Learners could choose to play/study in single or team mode the latter applied for learners who could not afford the smart device in class.

Once the pin code introduced, the lesson starts and learners were kept attentive so that not to miss any slide or quiz which may cause them loss of points. When a slide shows on the screen the teacher moderates and explains, but when there a quiz was displayed learners follow

the instruction so that to answer correctly on their devices because each quiz is timed. After each quiz the learner saw the points he has achieved and after completion of the lesson, their final ranks appeared on the leaderboard compared to their mates. The teacher on the other hand, receives on his account simultaneously a detailed report of each learner's performance, the difficult questions, the questions that were answered correctly or wrongly as well as the accuracy rate of each question along with other data. The report would help the teacher reflect on his teaching and make judgments on what worked, what hindered in a timely manner; which would enable him take corrective actions.

The teacher may also provide another pin code for homework assignment in order to reinforce the learnt material. The homework is set as a challenge on kahoot and is done by learners at home before the due date set by the teacher. The latter is notified simultaneously and after the deadline, he receives a performance report respectively. Learners also receive notifications to remind them of the homework before the due time or date.

4. Data Collection Procedures

A. Steps and Timeline

The research was conducted during the third trimester of the school year of 2022-2023. The study took place in Koibich Ahmed Middle School in Mesra district, at the city of Mostaganem. The experiment lasted one month and a half; starting from mid April until May 2023, after which a final summative exam is done for the end of the school year 2022-2023.

The experiment group engaged in vocabulary learning sessions that incorporate gamification using Kahoot! App. These gamified activities take the form of quizzes that use the

scoring system, rewards, progress bars, level tracking, leaderboards…etc. These quizzes take the form of MCQs, true/false questions, polls, puzzles, open questions…..etc. The control group however, received traditional vocabulary listening lessons that are not gamified but use text-book, flashcard and a speaker for the audio scripts. Additionally, the teacher prepared a video for the participants as a tutorial for the learners since they are not familiar with kahoot!. The video illustrates how to insert pin codes in class and how to search for other content related to the school syllabus.

B. Considerations and Ethical Issues

The study took place in Koibich Ahmed middle school in Mesra, Mostaganem where the researcher works as a permanent middle school English teacher during the school year 2022-2023. The study lasted three months from March to May 2023.

Before starting the experiment, the researcher requested an authorisation to conduct the study both from the headmaster of Koibich Amed Middle school at Mesra, as well as from the office of exams and trainings at the level of the education board in Mostaganem. After having received a written consent (**See Appendice3**), the researcher presented a copy to the head of the school for reference. Furthermore, the researcher also indicated beforehand on each learner's correspondence copybook the dates and time on which learners had to bring their smart devices. This step was very important to avoid any administrative, legal or moral issues especially that mobile phones are strictly forbidden in the class. However, it is permitable to use such smart devices in class for educational purposes; as stated by the Orientation law of education; issued in the official bulletin of the national education N° 599 dating from July 2018. It mentions regulations regarding the school life whereby the articles 55 and 56 in the third

chapter on the pupils rights and duties partially authorities the use of smart devices for educational reasons and with permission from the head of the school (Education, The Official Bulletin on the National Education, 2018, p. 48).

1. *Article55: "it is strictly forbidden to use the ICT tools inside the school for non-educational purposes, mainly the mobile and the iPad, and every means that would encroach the privacy of the stakeholders of education"(p.48)*

2. *Article56: "the use of ICT tools has to be warranted by the school administration under a prior written consent, especially when it comes to the download, transfer, share or publish the educational activities."(p.48)*

Hence, the researcher proceeds respectively by requesting the permission to use mobiles, iPads and/or computers from the head of the school as well as the educational board. Most learners brought mobile phones, two learners used the lap top instead. Other learners whose parents refused to give them the mobiles; joined their classmates in team mode. It happened that some parents didn't give their children the mobiles but they personally came before the class to give it to the teacher. The researcher also opted for an alternative way to use smart devices hybridly where learners receive content on kahoot! making use of their smart devices at home. This option applied for learners who could not bring their smart devices in class and had to work in a team mode with their classmates in class. Learners firstly receive content digitally in class through kahoot with the content of the lesson. After each session, learners are provided with a pin code of the said content and a pin code for a challenge to be done as a homework. The teacher simultaneously receives learners' performance through the report option in the app.

5. Data Analysis Procedures

A. Description of Statistical or Thematic Analysis Methods

1) Post and delayed post-test

A paired t-test was used to compare the control group and experience groups' performance after the use of the gamification tool Kahoot. This data analysis tool is mostly suitable for groups belonging to the same population; in our case second year middle school learners. A t-test is used to estimate the difference in means of both control and experiment groups and difference in scores before and after the treatment. In order to avoid any biased interpretations, other teachers who do not teach the participants corrected the post-test and delayed post-test sheets.

2) Teachers' interview

At an exploratory phase, the researcher opted for a structured interview because this method is well suited for the exploration of participants' opinions and enables researchers to probe for more information and clarification of answers. The interview tackles three aspects: teachers' awareness and competence regarding new teaching methods in addition to their experience applying gamification, games and game mechanics. Eleven middle school EFL teachers participated in the interview to share their attitudes vis-à-vis the use of gamification in education. The interview was done either on the phone or through audio messages via messenger. Two female participants chose the latter means, because they felt more comfortable.

The participants were randomly selected after having done a survey on facebook to choose teachers who use ICTs in their teaching. The survey was posted on three EFL teaching groups where teachers had to choose the ICT tool mostly used in their teaching; either

laptop/computer, data show or mobile applications. The teachers' age range from 25 to 50 years old and years of teaching experience differ from 5 to 25 years.

B. Software or Tools Used

1) Post and delayed post-test

In order to calculate the test scores and compare both the post and delayed post-test results, the teacher used SPSS to this end. As stated above, the tests sheets were corrected by peer teachers according to the scale provided by the teacher. After having received the corrected tests, statistic calculations were done on Excel with the help of the supervisor.

2) Teachers' interview

The data got from the interviews will be analysed based on a thematic approach. It is good suited for the themes discussed in the interview which are awareness, competence and experience. MAXQDA 2022 software was used for coding data according to categories. For the purpose of selecting participants, a survey was posted on facebook in two educational EFL middle school teachers groups. The survey was about whether teachers use datashow, cellphones and/or ipads or the classical way of teaching. Teachers who chose cellphones and ipads were contacted. 11 teachers accepted to take part in the interview on messenger and on the phone.

6. Pilot Study

The current research's objective is to discover the effect of gamification on learners' capacity to retain vocabulary through a digital gamified tool; namely Kahoot!. this action

research calls for a pilot study so that to enable the researcher to point out the difficulties as well the shortcomings while conducting of the study. A pilot study is referred to as the feasibility or the pre-testing study; which is a small-scale version of the main study (Polit et al., 2001:467). Piloting a study may not foresee the result of the study; nevertheless, it is a crucial step of the research protocol for the sake of improving the quality of the research and helps the researcher to be more experienced with the research instruments (In, 2017). The chief objective of the current pilot research was not to check the retention rate of the learnt vocabulary, but to assess the suitability of the tools being them technical or methodological. Else, the group chosen for the pilot research was a simulation of the control group whose participants ware not fixed at the time of the pilot study.

A. Purpose and Design

Prior to the main study, the researcher had to perform a trial in order to make sure of the possibility of conducting the so-called research. the pilot study was performed after having interviewed the teachers and analysed the results by mid-August 2022. The group chosen for the pilot study was a tertiary group namely 2m3 (The third class or group of second year middle school) who were informed about Kahoot!, how it works and how to get it from app store on Android. The pilot study took place at the beginning of the same school year (2022-2023), trimester one, while the unit chosen from the program for the pilot study was 'sequence two: Me and My Shopping'.

There were two trials; the first one was done before paying the fees of Kahoot!Pro subscription; where the teacher partially integrated Kahoot! in the first phase of the lesson using MCQ quizzes on data projector. Learners could see the functionality of Kahoot! and how it relates to their daily learning. At the end of the lesson, the teacher provided a code for a

homework assignment. Pupils were clearly informed that doing the assignment was optional and there would be no grades or punishment upon.

The second trial took place after having paid the subscription fees by the end of September2022. The advanced feature of Kahoot! enables the creation of more detailed content rather than simple MCQ or true false quizzes (basic features). The teacher could plan a whole lesson on kahoot! through slides and other types of advanced quizzes. The teacher could also include audio and audio-visual files for listening lessons; which are substitutes for speaker and YouTube videos.

B. Outcomes and Modifications Made

This step gave insight to the researcher about the pupils interest in learning through digital platforms, especially that teenagers often ignore the educational aspect of gaming and digital apps. Additionally, pupils reported their parents' approval or disapproval of the idea of uploading the application on the parent's mobile. Often parents kept a watchful eye on their child's use of the app to make sure that the content is safe for their age. It also helped the teacher test the telecommunication operators' internet service when shared on computer and mobile phone. Moreover, it was important to measure the internet quality required for Kahoot! platform.

As a conclusion, the researcher confirmed it was important to choose a class where the internet network is of a good quality in order not to waste time uploading the app on a shared screen. Moreover, the teacher had to inform the school logistics about the availability of the data projector, because the booking should be done beforehand. Lastly, the choice of the class 2m3 was not suitable for the purpose of the research since some pupils live in rural areas and cannot afford to have internet as often as possible. Consequently, the researcher opted for other

groups of the same level and whose conditions are merely better in terms of availability and digital literacy.

7. Limitations

A. Potential Biases

Conducting the experiment at the end of the school year might affect the post test results since learners might be worn out, overwhelmed or stressed because of exam preparation. Same for the delayed post test; learners often forget academic acquisitions after nearly 4months of vacation. At the beginning of the next school year, they sat for a diagnostic assessment along with remediation of the previously learnt material; which might also affect the post test results.

As far as the interview is concerned, the total number of interviewees is not considerable enough and unless it covers a wider range of participants, it won't give clear insights and perspectives with regard to the application of gamification through digital platforms in the Algerian context. Add to that the gender aspect, out of eleven participants only one male teacher was interviewed which as well might hinder the quality of data gathered.

B. Constraints in the Study Design

As in any research, unpredicted scenes do occur at any phase of the study and they are beyond the researcher's control. As far as the current study is concerned, two types of constraints were encountered; social and technical

On the social level, using digital platforms for formal language learning was a novelty to most learners and even parents. On the one hand, Pupils expressed excitement and enthusiasm towards the idea of studying online inside and outside the classroom setting; this excitement

often resulted in learners going beyond the bounds of the class management routine. To ensure a smooth flow of the lessons in a noise-free environment, the teacher set a reward of 2 points to learners who respect the class culture. On the other hand, for safety reasons, some parents did not welcome the idea that their children take their mobiles to school. Other permitted uploading Kahoot! and use it at home only; for this case, learners had the possibility to participate in a team mode on their peers' devices. Yet, the majority of parents allowed their kids to bring their mobiles, iPad and even laptop to school; some of whom came during the breaks and before the start of the class and brought the mobiles to the teacher.

To avoid any legal issues, the teacher informed the pupils about the lessons in which they would use the smart devices and wrote the exact date and time on their correspondence copybooks beforehand for their respective parents.

On the technical level, overcoming issues related to logistics, the availability of resources is quite important for the success of the research, and it should be handled with consideration as any other aspect of research. The researcher had to make sure that all the technological tools needed for the lessons were available including the teacher's laptop, data projector, internet connection, electricity, the pupils' devices and even the plugs in the classroom. The teacher used his own computer and the school's data projector. She had to book the latter at the logistics office and make sure that no other teacher would need it on the same day and time. As with internet connection, it happened that some pupils did not have internet access on their mobiles, the teacher either gave the 4G access to these pupils or used the school's internet upon permission of the school headmaster.

Conclusion

Through this chapter the researcher wished to detail the layout of the research design, the purpose of the study as well as the choice of the suitable methodology. It highlighted all the stages and phases followed by the researcher to conduct this quasi-experimental action research research. First of all, the researcher provided detailed explanation of Kahoot! being it the main scope of the study. This section gives an understandable background to the reader and the motivation behind that choice. Additionally, the researcher underlined the rationale behind the choice of mixed method approach. She then presented the participant taking part in the study and described their profiles in order to give clear image about the setting. Further, the research instruments that researcher opted for to back the research questions, test and verify the hypothesis. To collect data, the researcher introduced the instruments that would lead us to a comprehensible answer to the previously set research questions; namely; teachers' interview and a post-test along with a delayed post-test as well as the application Kahoot! as a means for gamifying the classroom context. In doing so, the researcher clarified and explained the steps followed whilst administering the teachers' online interview, the post-tests and the delayed post test.

CHAPTER FOUR: COMPREHENSIVE DATA ANALYSIS AND DISCUSSION

Introduction

The present study is groundbreaking research in the field of education. Digital education is still an unexplored area due to the novelty of the tools involved and the constantly changing technology, making it a challenging field to keep up with. The study focuses on the results and analysis of the data collected from teachers' interviews regarding gamification, as well as the post-test and delayed post-test scores of learners after the integration of gamification in the classroom. It aims to shed light on the impact of the implemented teaching strategy on the capacity of Algerian second-year middle school pupils to memorize vocabulary, using gamification.

Throughout the chapter, the reader will receive a detailed explanation of the tools used to analyse the interview and post-test, as well as delayed post-test data; specifically, MAXQDA and paired t-tests, respectively. While analyzing the collected data, the researcher chose Bloom's taxonomy as a method to facilitate a reliable interpretation of the tests. Moreover, presenting qualitative and quantitative data should be accompanied by a discussion of the findings and results that answer the research questions and ultimately lead to conclusions regarding the study's phenomenon.

I-TOOLS AND SOFTWARE EMPLOYED IN DATA ANALYSIS

Qualitative data from the interview were presented by depicting the core themes addressed, namely awareness, competence, and experience. Following a thematic analysis approach, the researcher could organize the data into themes and present the findings grouped accordingly. While doing so, the anonymity and confidentiality of participants were

maintained. Additionally, the quantitative results of the post-test and delayed post-test are presented in terms of percentages, frequencies, mean, and standard deviation. To test the hypotheses of this study and assess the impact and effectiveness of the implemented teaching method on Algerian second-year middle school pupils' retention capacity of vocabulary.

1. Quantitative Statistical Data Analysis

To analyze the quantitative data from the post-test and delayed post-test, the researcher utilized statistical tests, specifically a paired t-test and independent samples t-test. These tests were selected to compare and analyze the scores collected from the students in both assessments. The analysis was conducted using SPSS 29.0.2.0 software.

In this study, several hypotheses were formulated for examination. On the one hand, the primary hypothesis is that there is a significant difference in the mean scores between the experimental group and the control group. On the other hand, the null hypothesis (H0) states that there is no significant difference in the mean scores between the experimental group and the control group. These hypotheses were tested to investigate the relationships and potential effects within the study parameters. It is worth mentioning that there are four null hypotheses.

1- The post-test scores are equal to the delayed posttest scores of the control group.

2- The post-test scores are equal to the delayed posttest scores of the experimental group.

3- The post-test scores of both the control and experimental groups are equal.

4- The delayed post-test scores of both the control and experimental groups are equal.

In the case of the null hypothesis, there is no significant difference between the control and experimental groups, indicating that gamification has no effect on vocabulary retention. The alternative hypothesis suggests that gamification positively affected learners' capacity to

retain vocabulary in the EFL context. To verify the results, the author conducted both between-groups and within-group measurements. Firstly, she compared the post-tests of both the control and experimental groups, and then proceeded to compare the delayed post-tests. After that, a comparison was made within each distinct group. The performance of the control group in the post-test was compared with the delayed post-test, and the same evaluation was conducted for the experimental group.

2. Qualitative Thematic Data Analysis

The qualitative data obtained from the interviews was analyzed using a thematic approach. It is well-suited for the themes discussed in the interview, which include awareness, competence, and experience. MAXQDA 2022 software was used to categorize the data based on categories. The interview provided more in-depth insights about teachers' experiences, viewpoints, and perspectives, offering rich, detailed data that helps in understanding diverse perspectives on teachers' viewpoints regarding gamification in an EFL context. This interview enabled the researcher to contextualize and enrich findings by providing real-life narratives, personal experiences, and context-specific information, which can be valuable in interpreting and explaining research outcomes.

II-APPLICATION OF BLOOM'S TAXONOMY IN DATA ANALYSIS

The Algerian educational system places greater emphasis on the cognitive skills of learners. Henceforth, syllabus designers rely much more on Bloom's taxonomy to evaluate the acquired competencies. At Key Stage Two, second-year middle school learners are required to develop the necessary linguistic skills to fully address both the lower-order thinking skills and why not the higher-order thinking skills of Bloom's Taxonomy. Throughout the study, the

researcher sought to analyze learners' responses through the lens of Bloom's taxonomy, to investigate the affordances that gamification can offer for vocabulary learning and retention.

1. **The Analysis of Experimental Group Responses from the Perspective of Bloom's Taxonomy**

    The study's findings demonstrate that learners exhibit proficiency in achieving the analysis level of Bloom's Taxonomy, showcasing their ability to deconstruct, examine, and evaluate information effectively. The study's results indicated a significant achievement among learners in reaching the analysis level of Bloom's Taxonomy, as evidenced by their performance in both the post-test and delayed post-test assessments. Notably, following the instructional intervention, participants demonstrated a commendable ability to break down complex information, discern patterns, and critically evaluate concepts, as evidenced by their post-test scores. What is particularly noteworthy is the decreased retention rate over time. In the delayed post-test conducted several weeks after the initial assessment, learners were unable to sustain proficiency in applying analytical thinking.

    Implementing gamified elements, such as using Kahoot in the classroom, likely contributed significantly to positive outcomes to some extent. Gamification often enhances engagement, motivation, and active participation among learners. Kahoot, specifically, tends to create an interactive and enjoyable learning environment through its game-based approach, encouraging students to answer questions, compete, and collaborate in real-time. The nature of Kahoot's platform fosters a more dynamic and immersive learning experience. The competitive elements often stimulate a higher level of involvement and concentration among students. Moreover, the immediate feedback provided by Kahoot allows learners to gauge their understanding instantly, enabling them to address knowledge gaps promptly.

The gamified approach can also promote a sense of achievement and progression, encouraging students to strive for higher levels of thinking, such as the analysis level in Bloom's Taxonomy. By making the learning process enjoyable and interactive, Kahoot likely motivated students to delve deeper into the subject matter, facilitating their ability to analyze information effectively.

Overall, while Kahoot can significantly enhance engagement and immediate understanding, its effectiveness in supporting long-term retention and application of knowledge might vary. It is important to consider a variety of instructional approaches and tools to ensure a comprehensive learning experience that encompasses both immediate performance and sustained knowledge retention.

The impact of Kahoot as a gamification tool in an educational context can lead to unexpected outcomes in the long term. It can be concluded that gamified content taught using Kahoot cannot help learners maintain higher-order thinking skills of analyzing, evaluating, and creating in Bloom's taxonomy for a longer period of time. Nonetheless, learners at Key stage 1 (MS2 level) do not master the necessary linguistic knowledge to reach HOTs of Bloom's taxonomy. These learners are beginner learners of English and, are required to master the basic competencies enabling them –particularly- to describe daily real-life situations which entails the basic levels of Bloom's taxnomy. The discrepancy noticed in the delayed posttest between the control and experimental groups implies that Kahoot! immediate short-term benefits are derived from its competitive and interactive nature, rather than from continuous sustained capacity for knowledge retention. Another indicator that might disqualify Kahoot! One key aspect of vocabulary retention is that flashcards were primarily used as a tool for basic understanding and recall of concepts, rather than for deep comprehension. Furthermore, the way gamification is applied affects learners in their transfer of knowledge from passive

vocabulary to active vocabulary learning, which entails a deeper understanding, concretized application of vocabulary, and longer retention. Eventually, the effectiveness of gamification and Kahoot! In enhancing long-term retention and application of knowledge, the effectiveness might vary depending on other factors, such as the difficulty of the content, knowledge transfer, learning styles, reinforcement, and learners' personal efforts, etc.

2. Comparison with Non-Gamified Class Responses (Control group)

The results indicated a lower performance in the post-test assessment for the control group compared to the experimental group that participated in gamified classes. This suggests that the implementation of gamified teaching approaches had a positive impact, leading to notably higher achievement levels among the students involved in the experimental group.

Interestingly, the findings indicate that there was a noticeable difference in performance between the control group (not exposed to gamified classes) and the experimental group (who participated in gamified classes) in the post-test assessment. This outcome strongly suggests that the implementation of gamified classes, such as those utilizing Kahoot, had a positive impact on the learning outcome of experimental group. The superior performance of the experimental group suggests that the gamified approach probably enhanced comprehension, retention, and application of the subject matter compared to the conventional methods employed with the control group.

III-STATISTICAL ANALYSIS OF DATA WITHIN GROUPS AND IN BETWEEN GROUPS

As far as the analysis is concerned, a combination of tools was used depending on the specific nature of the data and the hypotheses we intend to test. The analysis was conducted in two different ways: firstly, an analysis within groups with a comparison of the post-test and the delayed post-test of the control and experiment groups separately, then a between-groups comparison was performed comparing the scores of the control and experiment groups in the post-test and another comparison of both groups in the delayed post-test. See **(Figure 4.1)**

The researcher started by comparting the post-test and the delayed post-test scores of the control and experiment groups separately; which results in four different analysis as explained in the table/diagram below . Firstly, the researcher compared the mean score of the posttest and the delayed post-test related to the control group and similarly to the experiment group. Then the post-tests of both control and experiment group were compared distinctly. The same comparative analysis was performed on the delayed post-tests of both control and experiment groups separately. And lastly, the researcher compared the overall performance of both groups based on the precedent results.

Figure 4.1:

Data analysis procedures and steps
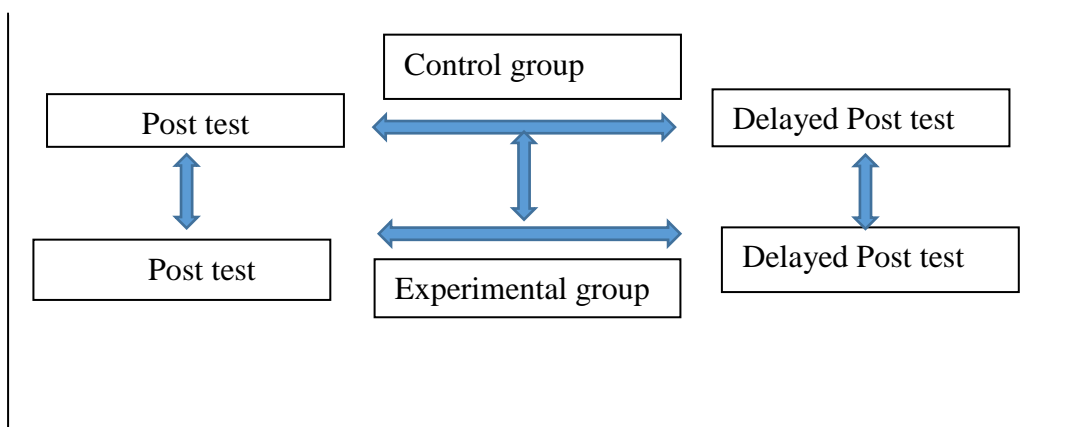
Paired Samples Statistics and correlations						
		Mean		Std. Deviation	Std. Error Mean	Correlation	Significance
Ccontrol	PostTest scores	5,1286	0	1,82512	,21814	,024	One-Sided p
	D_posttest scores	2,8714	0	1,72720	,20644		,423

Table 4.1: Comparing post-test and delayed post-test of the control group

1. Data Analysis of Groups' Scores

The analysis was conducted in two different ways, resulting in the same mean differences but with opposite signs. This reaffirms the consistency of the results obtained**.**

A. Control group

The data provided focuses on the control group's paired samples statistics for PostTest scores and D_posttest scores. it also provides insights into the performance and change observed specifically within the control group, serving as a crucial aspect for comparison and analysis in evaluating the impact or effectiveness of the intervention or treatment relative to this control group's performance. See (**Table4.1).**

The mean change in scores (D_posttest scores) for the control group was approximately 2.8714, with a standard deviation of 1.72720. This suggests the average difference or change in scores from the post-test to the delayed post-test within the control group and indicates how

much the scores tended to change from the post-test to the delayed post-test phase for this group.

control group displayed a mean post-test score of 5.1286.

Table 4.2: difference in score of post-test and delayed post-test of the control group

Paired Samples Test									Significance	
		Paired Differences								
					95% Confidence Interval of the Difference					Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	f	One-Sided p	
Control group	PostTest scores - D_posttest scores	2,25714	2,48290	,29676	1,66512	2,84917	7,606	69	<,001	<,001

Moreover, correlation coefficient of 0.024 between PostTest scores and D_posttest scores in the control group suggests a very weak positive correlation. The p-values (both one-sided and two-sided) indicate that this correlation is not statistically significant. The paired samples test indicates a statistically significant mean difference ($p < 0.001$) between PostTest scores and D_posttest scores within the control group.

B. The experiment group

As far as the statistics of the experiment group, the mean D_posttest score for Pair 2 is approximately 2.8714, indicating the average change or difference in scores of the post-test, and which suggests an overall improvement or higher performance in the post-test phase. In contrast, the mean PostTest score for the experiment group is about 5.1286, representing the average score achieved in the post-test phase within the same pair. The higher mean PostTest score within the experiment group indicates a positive improvement in scores after the intervention, suggesting a potential positive impact or effect of the gamified experiment on the group's performance. This data comparison provides insights into the changes observed within the experiment group.

Table 4.3: Comparing post-test and delayed post-test of the experiment group

Paired Samples Statistics		Mean	N	Std. Deviation	Std. Error Mean
Experiment group	D_posttest scores	2,8714	70	1,72720	,20644
	PostTest scores	5,1286	70	1,82512	,21814

Table 4.4: differences in scores of post-test and delayed post-test of the experiment group

Paired Samples Test									Significance	
		Paired Differences								
	Mean	Std. Deviation		95% Confidence Interval of the Difference		t		f	One-Sided p	

				Std. Error Mean	Lower	Upper				Two-Sided p
Exper iment group	D_posttest scores - PostTest scores	-2,25714	2,48290	,29676	-2,84917	-1,66512	-7,606	69	<,001	<,001

The negative mean of paired differences (-2.25714) indicates that, on average, the Delayed PostTest scores were lower than the PostTest scores within the experiment group; the paired samples test reaffirms a statistically significant mean difference. This negative sign suggests a decrease or decline in scores from the initial PostTest to the Delayed PostTest phase. Else, the T-value of -7.606, along with the very low p-values, indicates that this mean difference is statistically significant, implying that the observed decline in scores is unlikely to have occurred by chance.

The correlation coefficient of 0.024 between D_posttest scores and PostTest scores within the experiment group denotes a very weak positive correlation. Both one-sided and two-sided p-values indicate that this correlation is not statistically significant, implying minimal association between these scores.

In essence, while the correlation analysis showed minimal association, the significant mean difference identified through the paired samples test, along with the substantial effect sizes, emphasizes a noteworthy and practically significant discrepancy between the PostTest scores and D_posttest scores within the control group.

However, statistically significant decrease in scores from the PostTest to the Delayed PostTest phase within the experiment group suggests a potential decline or deterioration in performance over time. This information is crucial for understanding the sustainability or persistence of any effects observed immediately after the intervention or treatment. Further investigation or consideration of external factors influencing this decline may be necessary for a comprehensive interpretation within the context of the study or experiment.

C. Comparing Control and Experiment Groups

To sum up, The average difference between post-test scores and D_posttest scores is approximately 2.25714 units for control group , or conversely, -2.25714 units for experiment group Both pairs have non-overlapping 95% confidence intervals, which indicates a statistically significant difference between the two types of scores. The t-values are significant (both positive and negative) and the p-values are less than 0.001 for both groups. This suggests strong evidence against the null hypothesis of no difference.

The consistency between the two pairs supports the reliability of the findings. The observed differences between post-test scores and delayed post test are statistically significant, implying that these variables differ significantly from each other. Control and experiment groups show opposite signs, indicating that one type of score tends to be consistently higher (or lower) than the other across the sample. These results support the need for further investigation into the nature of these differences and their implications for your study or intervention.

Figure 4.2:

Post-test and delayed post-test scores.

Figure 0-1Posttest and delayed posttest scores.
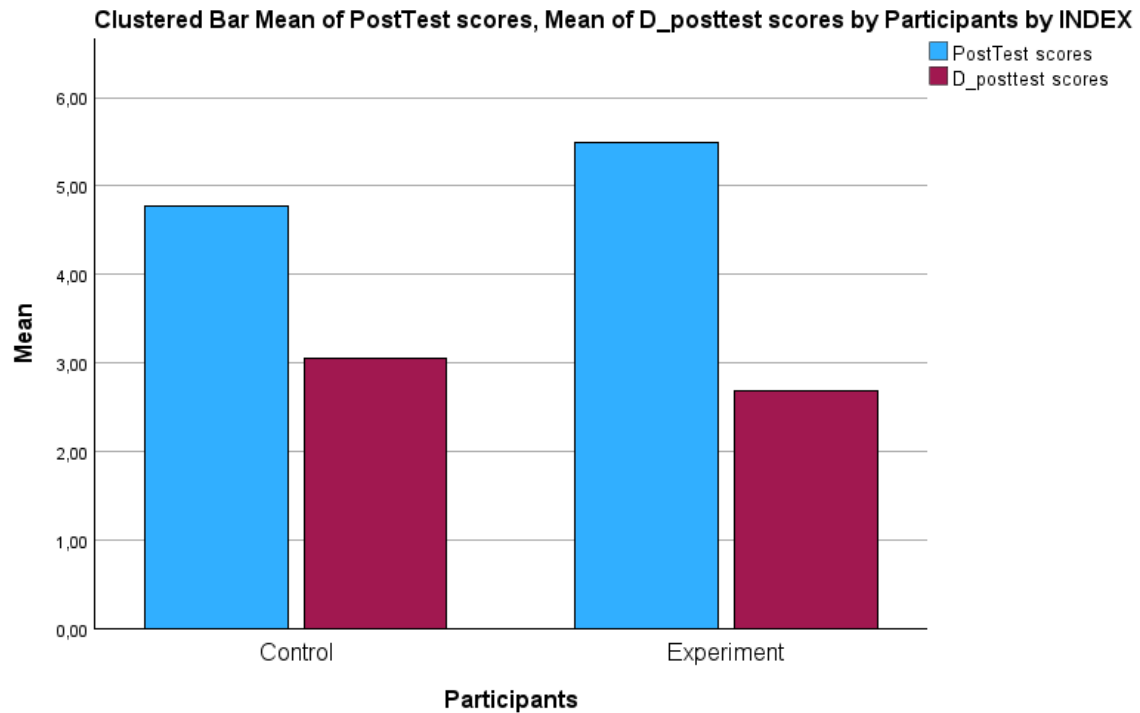
Overall, these statistics provide a detailed understanding of the distribution, variability, and central tendencies within the control and experimental groups for both types of scores. They shed light on the differences and similarities between the groups' performance, aiding in comprehensive analysis and comparison within this study's context.

2. Analysis of Score Differences Post- and Delayed Post-Treatment

An independent samples t-test was used to analyse data comparing the PostTest and delayed post test scores between the two groups; namely Control and experiment groups. Firstly the researcher will scrutinize scores of the post test to compare both group. Similarly, scores of the delayed post test will be analysed to see the difference between the same groups.

A. Post test scores of Control and experience group

The means of the Control and Experiment groups are 4.7714 and 5.4857, respectively. This suggests that, on average, the Experiment group scored higher on the PostTest compared to the Control group **(table)**. The standard deviation (Std. Deviation) for the Control group is 1.71646, while for the Experiment group, it's 1.88448. These values indicate the variability within each group's scores. The Experiment group appears to have slightly higher variability in scores compared to the Control group.

Table 4.5:

Comparison of post test scores of control and experiment groups.

Group Statistics					
	Participants	N	Mean	Std. Deviation	Std. Error Mean
PostTest scores	Control	35	4,7714	1,71646	,29013
	Experiment	35	5,4857	1,88448	,31854

The standard error of the mean (Std. Error Mean) for the Control group is 0.29013, and for the Experiment group, it's 0.31854. This represents the precision of the sample mean in estimating the population mean. Both groups have similar standard errors, suggesting that the sample means are relatively precise estimates of the population means. The mean difference between the groups is 0.71429, indicating that, on average, the Experiment group scored higher than the Control group on the PostTest.

Each of these effect size measures (Cohen's d, Hedges' correction, Glass's delta) indicates a considerable difference in PostTest scores between the Control and Experiment groups. The 95% confidence intervals for these effect sizes do not contain zero, indicating that the observed differences are likely not due to random chance and are considered substantial based on these effect size estimates.

Overall, based on the means, it appears that the Experiment group performed better on the PostTest compared to the Control group. However, further statistical analysis via the independent samples t-test would help confirm if this observed difference in means is statistically significant or merely due to chance.

B. Delayed post test scores of Control and experience group

Conversely the delayed post test scores were analysed as a comparison between the control and experiment group **(table 4.10)**. Control group (N=35) has a mean score of approximately 3.0571, with a standard deviation of 1.60775 and a standard error mean of 0.27176. Experiment group, however, has a mean score of about 2.6857, with a slightly higher standard deviation of 1.84345 and a standard error mean of 0.31160. The mean scores suggest that the Control group performed slightly better on the Delayed PostTest compared to the Experiment group, given the higher mean score.

Table 4.6:

Comparing the delayed post test of Control and experiment groups

Group Statistics					
	Participants	N	Mean	Std. Deviation	Std. Error Mean
Delayed posttest scores	Control	35	3,0571	1,60775	,27176
	Experiment	35	2,6857	1,84345	,31160

The Control group has a lower standard deviation compared to the Experiment group, implying less variability in scores within the Control group. The standard error of the mean is relatively similar between the two groups, indicating that the sample means are reasonably precise in estimating the population means.

This initial observation suggests that the Control group might have a higher average score on the Delayed PostTest compared to the Experiment group. Further statistical analysis, such as a t-test, would confirm if this difference is statistically significant or just due to chance.

When not assuming equal variances, the results still yield a t-statistic of 0.898 but with slightly adjusted degrees of freedom (66.766). The associated p-value remains 0.186. This outcome supports the conclusion that there's no significant difference in Delayed PostTest scores between the groups, even when variances are not assumed to be equal. The mean difference between the groups is 0.37143, suggesting a slightly higher average Delayed PostTest score for the Control group compared to the Experiment group. However, the confidence interval for the difference in means (-0.45362 to 1.19647 for equal variances

assumed) includes zero, indicating that the observed difference could be due to chance and is not statistically significant at the conventional alpha level of 0.05.

Despite the lack of statistical significance in the t-tests comparing the means of the Delayed PostTest scores between the groups, these effect size measures imply that there is a substantial and practically meaningful difference between the Control and Experiment groups in terms of their Delayed PostTest performance.

IV-QUALITATIVE INSIGHTS FROM TEACHERS' INTERVIEWS

This section delve into the perspectives and opinions gathered from the interviewees regarding gamification inEFL classroom. Thoughout the interaction with teachers, more in-depth and comprehensive data were gathered from the natural setting where educators speak up their thought in that regard. The interview unveiled ambiguity about teachers' knowledge, skills and practice of gamified approaches in EFL context.

1. Thematic Analysis of the Interview

The structured interview of teachers tackled three fundamental dimensions that would provide an in-depth insight on the teachers' standpoint with regard to gamification. These core axes include their awareness, competence and experience. In the process of teaching, we need to know the extent to whoch are teachers informed and cognizant of gamification and an operational concept, its principles, applications and the potential benefits. Then, the interview delved into the teachers' skilfulness in integrating and incorporation digital technology in general and gamification in particular to understand their competence in designing and implementing gamified activities in the teaching strategies. Competence in technology implies

application in real teaching contexts, hence experience. The latter encompasses the practical exposure with gamification and its impact in the classroom in addition to the challenges faced.

A. Awareness : Questions 1 to 5

Main question 1 : Are EFL teachers familiar with new teaching methods, including gamification?

Most teachers use the terms gamification and game-based learning interchangeably. However, when defining gamification, they add the notion of fun and interest to differentiate it from GBL. Gamification is described as a strategy used by teachers in the classroom to facilitate the learning of new language skills in a funny and interesting way. Another criterion for gamification is performance. "I believe that gamification is the utilization of games in the learning process to enhance learners' performance, whether it be in written or oral form." Overall, teachers associate the use of games, whether they are classical or ICT-based, with facilitating learning and improving performance. Amel from Setif Middle School defined GBL as: "a technique or a method used in learning." It involves playing games to understand the concept, such as crosswords, pickup games, the hangman game, and keyboarding games.

B. Competence: Questions: 6 to 9

Main Question 2: How competent are they in implementing gamification techniques?

In this section, participants were interviewed or assessed on their proficiency in gamification and game elements, as well as their actual utilization of ICT tools, as these are fundamental to the gamification process.

All interviewed teachers agreed on the use of ICTs, yet it is limited to a data projector, speaker, iPad, and laptop, since "*it is an obligation to use the computer and the data show….*" A few cohorts used cell phones along with a data projector to display content. Consequently, teachers are trying to adapt to modern means of communication, such as Facebook and Telegram, by utilizing interactive groups. Social media platforms help parents stay informed about the educational field, and the same goes for learners who can collaborate with their peers and teachers beyond the traditional classroom setting. The latter often shares extra educational curriculum resources for learners to benefit from. However, access to the internet is limited to only some learners. Some teachers have mentioned that they use social media to stay in touch with their students. *"I interact with my students through a Facebook group messenger.I rarely use the Viber app"*. Some individuals do not utilize it due to the fact that certain learners do not have access to the internet.

When asked about applying gamification, teachers didn't differentiate between classical games and gamification. When presented with examples of gamified apps or computer games used in teaching, they rejected the idea of using such methods, citing a variety of reasons such as lack of resources or, lack of knowledge about up-to date tech-based teaching methods. On the other hand, they are satisfied with the use of educational games such as puzzles, board games, spelling games, and jigsaw puzzles. Because they experienced learners' excitement.

Teachers often use games at the beginning stage as a warm-up or as an icebreaker to introduce the upcoming content lesson. Some educators incorporate games into their lessons, either during practice or at the end of the session, especially when teaching syntax. *"In fact, I am very selective in choosing the appropriate time to incorporate games (….) Depending on the time, the objective of my lesson, and the length of the game, I use some activities at the pre-phase to engage learners and capture their attention. However, sometimes it's better to leave it*

until the end (post-phase) to conclude my lesson and ensure that the lesson is successfully completed and understood by the learners."

Among the interviewed teachers, only one used gamification in teaching. She attributed this to the training she received at the beginning of her career. She stated, "*Well, since I learned about gamification in my training and applied it in my class, I can confidently say that it is extremely important.*"

The teacher has given examples of Duolingo and other language learning apps, such as Cake, FluentU, and HelloTalk. "*In the Duolingo game, there are many stages. For example, when you choose the beginner level.*" You can find plenty of subjects to learn, for example. Fruits. House Parts. In the sea... etc.

Despite teachers not actively implementing gamification or utilizing educational digital apps in their classrooms, they unconsciously incorporate elements of it. The game elements of gamification explained above are often present in English as a Foreign Language (EFL) classrooms. Teachers were provided with various game elements, including levels, rewards, badges, rules, challenges, competition, timers, and goals. Competition and challenge are recurring elements in games. According to the interviewed teachers, learners are more active when they are placed in competitive teams. This helps maximize their attention. The next element is reward. Whether it is a point, a star, a round of applause, or even a piece of candy, it has an undeniable effect on learners' behavioral performance. "*I often incorporate various game elements, but I have observed that rewards, such as competitions and challenges, are effective. Learners greatly appreciate rewards, even if they are simple gifts*." Other elements, such as levels and timers, occur less frequently. Teachers could assess the effectiveness of implementing gamification and its elements on learners' behavior and performance. "*I strongly*

believe that gaming is crucial in an EFL program as it offers numerous advantages, such as increasing learners' motivation." 2. Improving knowledge retention. "3. Better learner engagement."

C. Experience**:** Questions 10 to 14

Main Question 3: To what extent do learners accept the idea of learning through gamification?

Teachers show positive attitudes towards games: "I really enjoy playing games with my learners to break routine." They believe that being comfortable with games is essential for effective teaching and learning. To maximize the benefits for their students, teachers should thoroughly prepare their gamified lessons and utilize the available resources. Varying teaching strategies keep learners attentive and prevent them from falling into a routine. Some teachers believe that if the entire EFL program is gamified, it may lead to boredom, causing learners to lose engagement and motivation. Therefore, teachers would benefit from being flexible in their selection of techniques based on the needs and learning styles of their students. "*Gamification is just one method among many teaching strategies; it is not mandatory to apply it. It is up to the teacher to choose what suits their learners.*"

Education stakeholders have finally admitted that teaching and learning should be reset to meet the requirements of the new era. The World Wide Web is dominating all spheres of life, and the same can be said for gamification and technology. Today's digital natives won't accept anything but digital means of learning, so it's time to integrate and digitize education. It is now an obligation to move beyond the old system. Technology is an important element in teaching;

it saves time on one hand and facilitate learning on the other. It's like having a second teacher. So, it's time to let go of everything that is old. These new methods offer efficiency in terms of time and energy.

In an attempt to renovate their teaching methods, teachers often encounter difficulties that disrupt the flow of the class. Teachers encounter various challenges, primarily technical, when delivering gamified content. Despite the usefulness of gamifying the learning process, participants find it difficult to apply in an overcrowded class of more than 30 learners; they instead admit it would work better in tutorial sessions. The latter are scheduled once a week for all middle school levels and are intended to compensate for the previously missed lessons. In less crowded classes, all learners have the opportunity to participate and compete, among other benefits. Along with crowded classes, which is agreed upon as the primary barrier by all participants, chaos and noise occur as a result. This fact hinders teachers from effectively managing the energy of the learners and fulfilling their need to play and learn simultaneously. "Teaching students to understand and respect the rules of the games can be demotivating, as it requires time, especially if they are not accustomed to it. Time constraints and a lack of suitable logistics are also significant factors"

Other teachers, however, are aware of the teaching conditions in Algerian EFL classrooms. When asked whether they would recommend gamifying instruction to their peers, one of the participants mentioned, "*Sometimes I do, but it's a bit hard to convince them. They know that they can face problems with class management.*"

As a matter of fact, shifting to a newer method of instruction is a lengthy process that requires resources. "*Our institutions still lack the necessary resources, and even the number of students in a class is too high and precludes the use of such teaching and learning methods.*"

Policy makers should provide logistical support in terms of internet access, smaller class sizes, and training to ensure successful implementation of gamified teaching. "*It is tiring for the teacher to play the same game with more than eight or nine groups, especially considering the large number of pupils in some classes*." Preparation and training enable successful implementation of gamification. However, some teachers may lack proficiency in using ICTs, while others may be hesitant to adopt new teaching techniques due to concerns about functionality or losing control over the classroom. Eventually, being well-prepared makes it easier for the teacher to implement gamification, as some teachers find it challenging to apply games on the screen.

2. Analysis of Teachers' Perspectives on Gamification in Education

The results of the interview revealed that teachers often utilize game mechanics and dynamics to enhance learners' interest and engagement. Competition, rewards, leaderboards, and feedback are common game mechanics employed by teachers. Despite obstacles, teachers are open to innovations in language teaching. As far as information and communication technologies (ICTs) are concerned, some teachers utilize e-learning applications such as Duolingo, which primarily relies on gamification and is often presented through data projectors. The use of gamification in the EFL classroom is limited; this field of research and pedagogy requires empowerment.

The continuous development of a teacher is supported by their ability to innovate and implement new teaching strategies to transmit knowledge. Some teachers strive to employ innovative methods in an attempt to capture the attention and interest of learners as much as possible. From game-based learning to gamification, the pendulum swings back and forth to

achieve the desired goals. Little doubt exists about the utility of gamification and game-based learning (GBL); however, teachers often show reluctance to apply them. This could be due to familiarity, age factors, time constraints, or anxiety towards class management and teacher-learner interaction.

In the present research, teachers appear to be enthusiastic about incorporating gamification in educational settings, which is a promising sign for the future of learning. They demonstrate openness and readiness to innovations in language teaching despite existing obstacles that may hinder or slow down the process of integrating gamification into the teaching process. The results of the interview revealed that teachers often utilize game-like features, known as game mechanics and game dynamics, to stimulate learners' interest and engagement. Competition, rewards, leaderboards, and feedback are common game mechanics employed by teachers.

However, realizing the full potential of gamified learning systems necessitates a collaborative and well-coordinated effort from all stakeholders involved. This includes not only teachers but also learners, parents, syllabus designers, and policymakers. Each group plays a vital role in overcoming the barriers to successful gamification implementation, from technical challenges to resistance to change in conventional teaching methodologies. Moreover, there is a significant need for ongoing professional development focused on designing and implementing gamified lessons effectively. Educators must be equipped with the necessary skills and knowledge to integrate gamification into various pedagogical approaches and technological platforms.

V-Discussion of Findings

1. **Interpretation of Quantitative Data with Bloom's Taxonomy**

Gamification, while known to enhance engagement and performance, is often regarded as the top choice for achieving the highest level of creation in Bloom's Taxonomy. As for the test findings, they can provide a solution to help learners achieve the fundamental level of the taxonomy. At the knowledge level, learners can engage in tasks such as recalling vocabulary through gamified flashcard quizzes, matching quizzes, and puzzles. Additionally, the need for interaction with the game motivates learners to exert effort in understanding the vocabulary they receive and to establish connections with the game or their prior knowledge; otherwise, they will lose points and/or rank on the progress board. At the application level, learners need to communicate and solve problems, which necessitates applying and utilizing the vocabulary they have learned to complete a level or a quest. Based on the findings, analysis is the highest level reached by learners in the gamified environment. Learners connect vocabulary and categorize it based on meaning or relationship. In some instances during the productive stage, learners may struggle to produce complete sentences describing the weather. Nevertheless, they frequently establish connections between rain and cold, or sunny and hot.

Nevertheless, gamification has offered learners new perspectives on language learning. It opened up new avenues to the English language, especially for those who struggle with or lack interest in the language. To the teacher's surprise, after the end of the first gamified session, two learners whose voices were never heard in the previous sessions, and who are known to be very shy or unconfident and were not interested in learning English, have changed their minds. They came to the teacher asking about how to use Kahoot! At home for language learning.

2. Insights from Qualitative Interviews

There is a significant gap between teachers' awareness of gamification and its actual integration in the classroom. This gap highlights the cognitive levels where the disparity might occur, whether at the level of comprehension (awareness), competence, or experience. Being savvy or knowledgeable about gamification is not the sole key to an effective application. Instead, being savvy involves understanding gamification as an approach, its components, and the necessary tools, along with a systematic evaluation of its impact on the teacher and the learner. This evaluation should focus on interaction, engagement, performance, and learning outcomes.

Teachers do have some knowledge or familiarity with a variety of digital technology tools and their potential benefits in education, but they rarely utilize them in the classroom due to limited exposure to these tools either in their daily lives or in a professional setting. We can also infer that educators may not be proficient in incorporating gamified technology due to various factors, such as insufficient training, experience, or support, as well as feelings of inadequacy or incompetence.

The existing gap in knowledge and its application can be bridged through professional development. This will enable teachers to seamlessly transition from merely understanding the approach to applying it effectively. This shift, though it requires time and additional resources, should be incremental or gradual in order to identify any discrepancies or potential technical and/or financial constraints.

VI-Suggestions and Recommendations

1. **Practical Implications for Implementing Gamification in Educational Practices**

Gamification presents a transformative instructional approach because it brings about practical implications that significantly enhance learners' interest, retention, and promote their engagement and motivation. When teachers adopt gamification as an instructional strategy, they aim to capture learners' attention, maintain their focus, and ensure sustained interest throughout the learning process. Thanks to game elements such as points, rewards, challenges, competition, and interaction provided by gamification and digital learning platforms, learning becomes more engaging. This encourages learners to actively participate and demonstrate perseverance in pursuing the learning "mission."

A. Digital platforms (kahoot)

The field of English language teaching has experienced a radical change through the introduction of digital technology and e-learning trends into the learning process, such as online dictionaries, virtual exchange language platforms, and interactive apps. The quality that mostly characterizes digital platforms is the ease of use, which enables educators to leverage the potential of these digital tools and benefit from a variety of tools and materials that cater to the diverse aspects of language learning and learning styles.

Digital gamification saves time and energy by incorporating elements such as time limits and competition. It relieves teachers from the burden of constantly reminding students about class rules and helps keep learners engaged and focused on the task at hand. Moreover,

when learners become accustomed to the culture of gamification, the teacher's talking time (TTT) is reduced.

Vocabulary learning in Algerian EFL classrooms poses a challenge for both learners and teachers, but this can be addressed through the integration of digital technology. The features existing in Kahoot! such as time limits create a competitive atmosphere among learners, motivating them to actively participate in learning and exert more effort to grasp as much vocabulary as possible. Moreover, anxiety and uncertainty diminish when learners are provided with immediate feedback, which points out any misconceptions that might hinder effective vocabulary learning.

The classroom culture in the Algerian context may not allow for a direct transition to digital learning and teaching, as digital tools can be used to complement rather than replace traditional teaching strategies. Hence, a teacher can opt for a balanced approach that effectively combines traditional and digital strategies. There are diverse ways in which digital apps can be used in the Algerian EFL classroom. These apps can be utilized to teach vocabulary, enhance the four language skills, and deliver up-to-date skills and content, for instance:

a- Building vocabulary and reinforcing grammar: the flashcard game in Kahoot! Various apps help with learning new words and understanding their meanings by using images, audio scripts, or contextual sentences. Additionally, it is also possible to include grammar games to consolidate knowledge of tenses, sentence structure, and other grammatical rules. The immediate feedback helps in the continuous formative assessment of learners' knowledge. In a PPU (Presentation-Practice-Use) framework, grammar quizzes and games are perfect during the Practice phase to check understanding and pave the way for the production phase or 'Use'.

b- Listening skills: A teacher can enhance listening skills by incorporating video or audio clips into the learning process. This can involve tasks such as identifying accents, completing sentences, recognizing specific words in context, and transcribing sounds in words. Listening quizzes, such as true/false statements or filling in gaps, encourage learners to concentrate on the audio material and work on extracting key words and meanings. In a Pre-During-Post (PDP) listening lesson, a teacher may use puzzle quizzes, multiple-choice questions (MCQs), or true/false statements in the pre-listening and during listening stages to assess the listening skills of learners.

c- Speaking skills: Furthermore, learners can enhance their speaking skills by participating in the game through recording their voices. This can enrich collaboration and interactive communication among the class members. One example is reordering dialogues, acting roles, and plays, etc. This feature of voice messages and conversations is very trendy and common in the cutting-edge field of AI (Artificial Intelligence) but is often overlooked by young language learners.

d- Reading skills: Reading skills are very important for enriching one's vocabulary. Teachers can design task-based quizzes to assess learners' comprehension of the main ideas and details of the content by using skimming or scanning techniques. Additionally, digital apps provide content that allows learners to explore other English-speaking cultures, including their customs, traditions, idiomatic expressions, and codes, which promotes cultural awareness and openness. Eventually, the teachers will be able to evaluate their learners' comprehension, interpretation, and critical thinking skills.

e- Writing skills: When it comes to writing skills, a teacher may opt for the quiz of polls such as those available on Kahoot! Features in the paid version are available in the last phase of the lesson, namely, Use or Post-listening or reading. This feature enables learners to write short texts, provide the beginning of a sentence, or complete missing words related to the taught content. Students engage in interactive group discussions, express their opinions, and argue about questions or statements posed by the teacher on the shared screen. This feature is suitable for beginner to intermediate level students who write short texts, not essays or long paragraphs. Nevertheless, it enables the teacher and learner to point out strengths and weaknesses in terms of vocabulary and grammar.

f- Reviewing and revising content: Teachers can track their learners' progress and understanding through assigned challenges on hybrid learning platforms. On the one hand, learners can review or revise content to prepare for tests or exams by revisiting previously assigned challenges or working on individual ones. This practice helps them reinforce their knowledge and build confidence before exams. On the other hand, they can create their own quizzes based on the learned content to share with peers for constructive collaborative learning.

Henceforth, Kahoot can be used as a brainstorming tool before presenting data to learners. The teacher can assign a challenge to learners to assess their knowledge of a new concept or topic, such as body parts. It can also be used to reinforce previously learned material. Teachers can assign Kahoot-based homework to track learners' responses. Through Kahoot, learning can be learner-centered, where the teacher assigns challenges and allows learners to work and self-assess their progress.

All of the previously mentioned techniques can be adjusted according to learners' levels of proficiency and the difficulty of the material being taught. Integrating gamification elements such as points, time pressure, leaderboards, and feedback ensures engagement and focus among learners, ultimately reducing distractions and anxiety.

Throughout the study period, the teacher observed some behavioral changes in the experimental group. Some students lacked enthusiasm for language learning, at the beginning of the school year, and put minimal effort into it. Remarkably, their reaction was so surprising that it remained etched in the teachers' memory, as if the session had sparked their interest and motivation. They were engaged and joined their teammates in a team, participating with the limited linguistic knowledge they had. After the session, some students approached the teacher inquiring about additional challenges to work on at home, while others were primarily focused on accumulating points. Another student was interested in using Kahoot! to revise or review other subjects.

B. Blended gamification (traditional and digital)

Designing a lesson plan based on gamification elements would enhance the teaching process. Incorporating storytelling, creating quests or challenges, progress tracking, and rewards can be utilized consistently and separately. However, the classroom culture in the Algerian context is still in the early stages of incorporating gamification into education. A blend of traditional and digital gamification may best suit the Algerian classroom. Traditional and digital gamification share common fundamental features, but the difference occurs at the level of the medium in which each one is implemented.

Firstly, traditional gamification involves the continuous or excessive use of badges, rewards, feedback, leaderboards, etc., in non-digital, offline, or real-world settings without the use of digital technology. Gamification, as explained earlier, was implemented even before the term was coined and became a trendy approach. However, traditional gamification is characterized by a consistent use of game elements and mechanics without integrating technological devices. Secondly, digital gamification cannot be implemented without digital tools such as digital platforms or apps where the creation, delivery, and processing of content are done in an online environment. To better explain both approaches, the table below differentiates between traditional and digital gamification, highlighting the merits of each for improved implementation (**table 4.7**).

Table 4.7:

Differences distinguishing traditional from digital gamification.

	Traditional Gamification	Digital gamification
Setting	Real-world setting, offline	Online and offline
Accessibility	Learning is limited to physical setting and only learners who are present.	Learning can reach wider range of learners regardless to place or time.
data/progress tracking	Tracking of learners performance takes time and does not cover all aspects of learning.	Easy, timely and detailed collection and tracking of learners' responses and performance.
Interaction	Face to face interaction only	Face to face and online interactions
Feedback	Real time feedback but not always immediate.	Instant real time feedback

Preparation	Requires training and preparation.	Requires training and preparation.
Cost efficiency	Not as costly as digital gamification, sometimes needs material or tangible game elements like badges	Requires internet access, software

In a blended gamified approach, where traditional teaching is combined with game design elements, the classroom and the learners experience some changes that affect the teaching and learning process. If the educator succeeds in preparing well for his gamified class and finds ways to overcome challenges or obstacles, he would enjoy several benefits, including but not limited to flexibility, interaction, engagement, collaboration, and assessment, to name a few. By emphasizing flexibility, learners can create opportunities for self-learning and collaborative learning both inside and outside the classroom, since gamification is easily accessible and can accommodate different learning styles and preferences. Further, in a blended gamified classroom, leadership should be given to learners from time to time. By doing so, the teacher can choose traditional gamification methods inside the classroom while learners create challenges related to the previously covered content. This stratagem makes the learner responsible for his learning and creates individualized learning paths.

The choice between traditional and digital gamification, or a combination of both, depends on the goal of the strategy, the content, and the learners. These factors determine which strategy is more advantageous than the other, as both traditional and digital gamification have strengths and shortcomings. Finally, it is not possible to rely 100% on digital technology because learners need to take notes and record the essential elements of what they have learned

in writing or on handouts. Furthermore, when combining traditional gamified teaching with digital gamified teaching, it is important to consider the needs of the learner, their learning styles, and performance. Educators should strive to strike a balanced approach to ensure that the game elements align with the learning objectives.

VII-Future Directions for Research on Gamification in Education

Academic research on the integration of gamification in the educational system in Algeria is scarce. Researchers can provide valuable insights into several aspects of gamification, such as investigating the implementation of individual game elements and determining their effects on learners' behavior and performance. Comparative studies could provide insights that facilitate the effective selection and implementation of each game element or mechanic.

Moreover, our interviews with teachers revealed their continuous need for updates on new trends in education and additional professional training on integrating gamification in EFL classrooms. These trainings are not only aimed at teachers but also at syllabus designers, with the guidance of experts in the field of educational digital technology. Continuous professional training will encourage and motivate hesitant teachers to embrace the new approach and provide ongoing support to those encountering challenges in their gamified classes. As far as the teaching material is concerned, it would be interesting to know which aspect of language learning could benefit more from gamification and which of the four linguistic skills are better taught or learned through gamification.

In the same vein of thought, continuous professional development (CPD) is a key to an effective implementation of gamification in EFL classrooms. Teachers can participate in seminars, workshops, or online courses and webinars to enrich their knowledge and receive

peer feedback on new strategies and methods in language teaching. This helps teachers develop a culture of sharing and continuous learning within their educational community. Teachers can also participate in collaborative projects with the mentorship of experts and experienced teachers. This fosters communication, a supportive environment, a sense of initiative, and a culture of sharing and collaboration. This process might take time and effort, but it will eventually strengthen the digital skills that are relevant to digital language teaching, such as digital lesson planning, assessment, class management, and adapting teaching to different learning styles. Access to educational resources such as websites, platforms, and articles will optimize teachers' willingness and openness to apply new teaching methodologies.

Other areas of research could explore the adaptability of students in the context of gamified learning implementation. It would be valuable to understand how various age groups and proficiency levels are influenced by different gamification strategies or game elements. Furthermore, the cultural context of the Algerian classroom differs in terms of values and norms. Hence, cultural relevance is one of the critical components to take into consideration while designing a gamification approach. Additionally, achieving a balance between intrinsic and extrinsic motivation is one of the primary concerns for all education stakeholders. It is worth studying whether gamification has an impact on intrinsic or extrinsic motivation, or which game element has the most notable effect on motivation.

Hence, it is the role of academic institutions and authorities in the educational system to collaborate for fruitful research development in gamification. In order to design research studies, apply gamified interventions, and discuss performance, the collaboration of researchers, educators, and policymakers is essential.

Conclusion

The findings support the argument for integrating gamification, such as Kahoot, into educational practices to enhance learning outcomes, engagement, and potentially students' ability to achieve the basic cognitive levels, such as application in Bloom's Taxonomy. This result reinforces the potential benefits of incorporating interactive and game-based methodologies in educational settings to improve students' academic performance. As previously noted, gamification offers a variety of strategies for teachers to adapt and apply according to the subject matter, their objectives, the needs of learners, and their learning styles. Gamification tools used in formative assessment, such as Kahoot, have a significant effect on focus and concentration, but there is not a remarkable difference compared to non-gamified response systems like Clicker (Wang, Zhu, & Sætre, The Effect of Digitizing and Gamifying Quizzing in Classrooms, 2016).

Surprisingly, the experimental group did not perform well in the delayed post-test compared to the control group. Several factors might have contributed to this unexpected outcome, such as short-term focus, lack of reinforcement, lower skills in knowledge transfer, and a variety of learning styles that might not favor gamified content. The gamified approach may have emphasized short-term engagement and immediate learning gains rather than focusing on long-term retention or application of knowledge. Hence, while initially effective, this method might not support sustained learning over time. Furthermore, the gamified method might not have included reinforcement or spaced repetition techniques that aid in long-term memory retention, especially considering that the participants engaged with the gamified content towards the end of the school year. The timing of the experiment could have significantly influenced the findings.

These possibilities highlight the complexity of educational research and the influence of multiple factors on learning outcomes. They suggest that while the immediate effects of gamified instruction favored the experimental group, there might have been aspects where the control group excelled in the long-term retention or application of learned concepts. However, if the control group consistently outperformed the experimental group, it might prompt a deeper analysis to understand why the gamified approach didn't yield the expected results. This could involve examining the implementation of gamification, refining the methodology, or exploring other variables that might have affected the outcomes. Exploring these differences further could provide valuable insights into the effectiveness of different teaching methodologies across various time scales.

Conversely, the control group performed better in the delayed post-test after a period of nearly 4 months had passed since the initial assessment. This could imply several possibilities, including but not limited to the way learning was transferred, long-term learning strategies, retention ratios of learners, and other unnoticed factors. The control group might have been better at applying the learned concepts in new contexts, showcasing a deeper understanding or the ability to transfer knowledge, even though they didn't experience the gamified instruction. Otherwise, learners might have utilized various learning strategies that supported long-term retention and application of knowledge. These strategies, such as using a dictionary and reinforcing the learned material outside the classroom, could have been implemented independently of the gamified approach used by the experimental group. Additionally, individual capacities of retention and understanding of the taught material over time may vary based on the nature of the content and the instructional methods used, even without gamification.

Understanding why the experimental group didn't perform as well in the delayed post-test compared to the control group requires a more in-depth analysis of the instructional methodologies, learning processes, and the specific content assessed. It is essential to assess not only immediate learning outcomes but also the strategies that support long-term knowledge retention and application across various instructional approaches. This examination can provide valuable insights into refining educational methods to support sustained learning outcomes over time.

However, while the positive outcomes are attributed to the gamified classroom using Kahoot, it is essential to consider other factors that might have contributed to the results. These could include the quality of instructional design, the alignment of content with learning objectives, the teacher's facilitation skills, and individual student differences. Evaluating these factors in conjunction with the use of Kahoot would provide a more comprehensive understanding of the observed success. According to Owen & Licorish (2020) "Kahoot! enhances secondary and tertiary students' attention and motivation during class, but its effectiveness on learning and retention of course knowledge may vary depending on situational and individual factors" (p.1). While the gamified learning fostered immediate understanding and engagement, it might not have sufficiently encouraged the transfer of knowledge or application of learned concepts to new contexts. Moreover, individuals in the experimental group might have had diverse learning styles that were not effectively accommodated by the gamified approach.

It goes without saying that gamification has a significant impact on the teaching and learning process. This effect is measured and noticed in almost all aspects of classroom life and interaction. Gamification cannot be considered a legitimate teaching tool unless it successfully fulfills the teaching and learning objectives to a certain extent. The study may not have yielded

significant results in terms of vocabulary retention because the techniques were novel to them. They could have been more interested in the game rather than the lesson or learning. Another reason was the short duration during which gamification was implemented; a single term was insufficient to evaluate the impact of gamification on vocabulary learning and retention. It should be noted that the majority of learners are not familiar with e-learning platforms or applications. For their extracurricular learning, they often refer to YouTube or cross-curricular educational groups related to their study level.

The pillar or the bridge that transports knowledge to the learner is the educator, without whom the learning cycle would not be complete. Investing in comprehensive and ongoing training programs would educate teachers about emerging trends in education and the advantages of innovative educational technology in enhancing teaching and learning. Authorities in the educational system are urged to listen to the needs of teachers and equip them to meet the requirements of the 21st-century learner. Organizing conferences, seminars, or online courses in collaboration with policymakers, experts, and teachers will pave the way for the effective implementation of up-to-date teaching approaches.

Continuous research and development are essential to evaluate the impact of gamification on learning outcomes and to evolve these strategies based on empirical evidence. It is also crucial to approach gamification with ethical and inclusive considerations, ensuring that it benefits a diverse range of learners and fosters a positive, collaborative educational environment. By addressing these aspects, we can steer the educational system towards a more engaging, interactive, and effective paradigm, leveraging the power of gamification to enhance the learning experience for students of all ages.

GENERAL CONCLUSION

In 21st-century education, there has been an urgent call for a technology-powered education system due to the dynamic changes occurring at irregular intervals that influence all aspects of life. The present research deals with the current approach in education and language learning. The so-called gamification has made its way into the classroom with the hope of improving certain elements in teaching and learning, and assisting teachers in overcoming obstacles and challenges in delivering content knowledge.

The present research examines the implementation of gamification in language classrooms in the Algerian context using Kahoot! application. It incorporates a quasi-experimental study and involves a mixed-method approach for action research. Throughout the study, the researcher conducted a comprehensive investigation into the potential effect of gamification on learners' ability to retain vocabulary. The tools used in the investigation included interviews with teachers before the main study as an exploratory step. This phase helped to gain an understanding of the phenomenon and its feasibility in the Algerian context. The results indicated the parameters that the researcher should rely on when performing the experiment. After that, the researcher planned the core tasks of the main research study, which included implementing gamified content using Kahoot!. The second phase consisted of using test measurements, namely post-test and delayed post-test, to evaluate the effectiveness of gamification for vocabulary retention. In order to confirm if the design of the gamified content is well-suited, the researcher opted for a pilot study to avoid any unpredicted discrepancies and find solutions. The pilot study was conducted with a tertiary group that was different from those enrolled in the experiment.

The findings show that teachers are aware of the changes occurring in the domain of e-learning, and they even demonstrate openness towards implementing new strategies such as gamification. Yet, they expressed their discontent with some factors that hinder the advancement of educational technology and the implementation of gamification in the classroom, such as infrastructure, resource shortages at the school level, and overcrowded classes. The interview provided insights that the implementation of gamification in language teaching is feasible; consequently, the second phase of gamification implementation was initiated. After using Kahoot! In the classroom, two tests were conducted with the control and experimental groups to evaluate the learners' retention rate of vocabulary: an immediate post-test after the lesson and a delayed post-test after a period of approximately four months. The scores of the tests showed significant results; the experimental group scored higher in the immediate post-test compared to the control group. Counter to the experimental group, the control group scored better on the delayed post-test, prompting the researcher to investigate the factors that influenced the experimental group's decline in scores on the delayed post-test. Additionally, the period preceding the delayed post-test occurred during vacation, when learners were not actively engaged in cognitive activities. This lack of engagement may have influenced their performance in the delayed post-test. With this in mind, learners' performance could have been different under other conditions, which could be addressed in further research.

The present study is original and contemporary and it would certainly contribute to the existing literature on vocabulary learning and retention in a gamified setting. To our knowledge, this particular topic has not been addressed thus far, and little has been said about gamified vocabulary retention, especially in the Algerian context. Despite the many obstacles encountered during the first and second phases of research, the researcher was able to identify the use and effectiveness of gamification for vocabulary learning and retention. We firstly

succeeded in delineating the pearls and pitfalls of incorporating gamification based on Mishra and Koehler's TPACK model and Sweller's cognitive load theory. Additionally, we have developed a proposed idea for a blended gamification project that would align with the characteristics of the Algerian educational and cultural context. In a blended gamification approach, emphasis should be placed on reinforcement both inside and outside the classroom to achieve a sustained vocabulary retention rate.

The current research project will pave the way for other researchers interested in cognitive sciences and educational technology aiming to enhance language learning and vocabulary retention among young learners, specifically. In addition, various aspects of language learning could be gamified in the classroom, including grammar, phonetics, and the four language skills. To conclude, the study highlights deficiencies in training and resources, both financial and human. It calls for collaborative participatory actions from all stakeholders and education practitioners, including policymakers, syllabus designers, and teachers, to cater to the needs and aspirations of the 21st-century learner. They have a mission to amend, adjust, and re-calibrate instructional practices based on current digital learning pathways to enhance EFL teaching. On the sociocultural level, it is important to consider various factors such as the cultural attitudes and perceptions of all educational stakeholders, technology infrastructure, professional training, content relevance, cultural diversity, and the involvement of parents and education policymakers.

By way of conclusion, the researcher acknowledged the fact that challenges and limitations are inevitable in research. Still, these hurdles and complexities should be handled with consideration, as they provide a clearer understanding of the subject undertaken and offer insights for improvement. Due to the peculiarity of the educational policy in Algeria, it was not easy to use smart devices such as mobile phones and iPads inside the classroom without official

written consent from the Directorate of Education in Mostaganem, as well as the approval and collaboration of the school headmaster. Additionally, convincing parents to allow their children to bring their smart devices to school was not an easy task. The researcher had to present arguments to reach a middle-ground agreement. Eventually, the researcher decided to refrain from using smart devices to teach the entire sequence. On a technical level, the school's data projector was outdated and had some technical issues that needed to be fixed before the operation could begin. Adding to that, the shortage of data projectors was a serious obstacle. Only two data projectors were available, and teachers frequently requested them. As far as the interview is concerned, thanks to Facebook groups, the researcher was able to reach a large number of EFL teachers, with 110 participants taking part in the interview. Some of the female participants chose not to record their voices and instead opted to type their answers on Messenger. Flexibility in research opens the door to adapting and revising plans according to unexpected circumstances because research is an iterative process.

On that basis, two parameters have influenced the current research. Firstly, the cognitive parameter appeared in the learners' test scores for vocabulary learning and retention. Secondly, the sociocultural parameter played an important role in technology-powered language education and its perception and attitudes in the Algerian context among learners, teachers, education policymakers, and parents. Admittedly, having overcome all of the aforementioned constraints emphasizes the need for more research and contributions in the field of educational digital technology, with a greater focus on educational gamification. The latter is still an undiscovered area in Algeria, and the efforts that have been made to unveil its potential in language learning are fruitful. Follow-up research attempts should build upon these efforts to reach significant conclusions.

Success is like an iceberg, as James Clear, the author of "Atomic Habits," argues: "It is easy to overvalue the outcome and undervalue the process." We are often mesmerized by the results of research, but what lies behind them are the unforeseen constraints that are integral parts of any research conducted in pursuit of knowledge. All the limitations, mistakes, and ignorance are subject to learning and refinement; they are opportunities that shape the trajectory of research and help us grow methodologically.

List of References

- Abebe, M. (n.d.). Utilizing Kahoot to assess understanding. Retrieved 10 21, 2023, from Teaching Resources Stanford.Edu: https://teachingresources.stanford.edu/resources/utilizing-kahoot-to-assess-understanding/

- Abrams, S., & Walsh, S. (2014). Gamified Vocabulary Online Resources and Enriched Language Learning. *Journal of Adolescent & Adult Literacy*, 58(1), 49–58).

- Abt, C. C. (1973). Serious Games. Boston: University Press of America. Retrieved from https://books.google.dz/books?id=axUs9HA-hF8C&pg=PA3&hl=fr&source=gbs_toc_r&cad=2#v=onepage&q&f=false

- Abt, C. C. (1978). Serious Games. New York: University Press of America. Retrieved from https://www.google.dz/books/edition/Serious_Games/axUs9HA-hF8C?hl=ar&gbpv=1&dq=an+activity+among+two+or+more+independent+decision-makers+seeking+to+achieve+their+objectives+in+some+limiting+context&pg=PA6&printsec=frontcover

- Abu Bakar, N., & Nosratirad, E. (2013). Sustaining Vocabulary Acquisition through Computer Game: A Case Study. 9(5). doi:10.5539/ass.v9n5p235

- Aidoune, Y., Nordin, N., & Singh, M. (2022). Effect of Online English Learning Game 'Kahoot' on L2 Undergraduate Learners in a Malaysian University. *Journal of Intercultural Communication*, 22(3), 13-18. doi: https://doi.org/10.36923/jicc.v22i3.66

- Aka, S. (2017, 12 25). Bloom's Taxonomy & Learning Retention. Retrieved from www.adventisteducators.org: https://www.adventisteducators.org/2017/12/english-article-78/

- Alasmari, N. J. (2020). The Mind of a Good Language Learner: A Case Study of Vocabulary-learning Strategies. *International Journal of English Language Education*, 8(1). doi:doi:10.5296/ijele.v

- Ammour, K. (2009, May). Thesis: Teaching Reading Strategies and Skills at Middle School: The Case of Tizi-Ouzou. Tizi-Ouzou, Algeria: University of Mouloud Maamri- Algeria.

- Anderson , L., & Krathwohl , D. (2001). A taxonomy for learning, teaching, and assessing : a revision of Bloom's taxonomy of Educational Objectives. Longman. Retrieved from https://www.uky.edu/~rsand1/china2018/texts/Anderson-Krathwohl%20-%20A%20taxonomy%20for%20learning%20teaching%20and%20assessing.pdf

- Anderson, L., & Krathwohl, D. (2001). A taxonomy for learning, teaching, and assessing : a revision of Bloom's taxonomy of educational objectives. Longman.

- Anyi, C. L. (2019). Evaluating the Effectiveness of Digital Game-Based Learning in Second Language Vocabulary Acquisition. Retrieved from http://hdl.handle.net/1853/62100

- B. Zou . (2022). K-12 teachers' perceptions of the effectiveness of online EFL teaching and learning during the COVID-19 pandemic. De Gruyter, 47.

- Baddeley, A. (2003). Working memory and language: an overview. *Journal of Communication Disorders,* 189-208. Retrieved from https://edisciplinas.usp.br/pluginfile.php/5629283/mod_resource/content/1/memoria%20de%20trabalho%20e%20linguagem.pdf

- Bartle, R. (1999, August 28). Hearts, Clubs, Diamonds, Spades: Players Who Suit Muds. Retrieved from www.mud.co.uk: https://mud.co.uk/richard/hcds.htm

- Bartle, R. (1999, August 28). Hearts, Clubs, Diamonds, Spades: Players Who Suit MUDS. Retrieved from www.mud.co.uk: https://mud.co.uk/richard/hcds.htm

- Bartle, R. (2009). Understanding the Limits of Theory. In C. Bateman (Ed.), Beyond Game Design: Nine Steps to Creating Better Videogames. Delmar.

- Bartle, R. (n.d.). Hearts, Clubs, Diamonds, Spades: Players Who Suit MUDS. Retrieved from www.mud.co.uk: https://mud.co.uk/richard/hcds.htm

- Becker, K. (2017). Advances in Game-Based Learning. Choosing and Using Digital Games in The Classroon. A Practical Guide. Canada: Springer.

- Becker, K. (January 2021). What's the difference between gamification, serious games, educational games,and game-based learning? . Academia Letters.

- Becker, K., & Nicholson, S. (2016). Gamification in the Classroom: Old Wine in New Badges. In K. Schrier, Learning, Education and Games . Volume Two: Bringing Games into Educational Contexts (pp. 61-85). ETC Press.

- Bell, K. (2018). Game On!: Gamification, gameful Design, and the Rise of the Game Educatore. Baltimore: Johns Hopkins University Press.

- Benjelloun, M., & El Allame, Y. (2019, June). Bloom's Taxonomy and Moroccan Children's Vocabulary and Critical Thinking Skills Development. *Arab World English Journal (AWEJ)*, 10(2), 342 -352. doi: https://dx.doi.org/10.24093/awej/vol10no2.26

- Biworldwide. (2016). Gamification. Retrieved January 2022, from https://www.biworldwide.com/gamification/bunchball-nitro/

- Bloomfield, L. (1933). Language. London: Compton Printing LTD.

- Bocska, S. (2012, September 12). Gamification Pitfalls: Badge Fatigue and Loyalty Backlash. Retrieved from www.gamification.co: https://www.gamification.co/2012/09/12/gamification-pitfalls-badge-fatigue-and-loyalty-backlash/

- Bogost, I. (2014). Why Gamification Is Bullshit . In S. P. Deterding., The Gameful World. Approaches, Issues, Applications (pp. 65-79). Massachusetts: MIT Press.

- Bourke, B. (2019). Using Gamification to Engage Higher-Order Thinking Skills. IGI Global.

- Bunchball. (2010). Gamification101: An Introduction to the Use of Game Dynamics to influence behaviors. Bunchball. Retrieved from https://jndglobal.com/wp-content/uploads/2011/05/gamification1011.pdf

- Cambridge. (2023). Cambridge English Kahoot. Retrieved 10 21, 2023, from Cambridge English: https://www.cambridgeenglish.org/teaching-english/resources-for-teachers/kahoot/

- Cambridgecognition. (2015, August 19). What is cognition? Retrieved from cambridgecognition: https://www.cambridgecognition.com/blog/entry/what-is-cognition

- Caro, K., & Mendinueta, N. (2017, March). Lexis, Lexical Competence and Lexical Knowledge: A Review. *Journal of Language Teaching and Research*, Vol. 8, No. 2, 205-213. Retrieved from https://www.academypublication.com/issues2/jltr/vol08/02/01.pdf

- Carter , R., & McCarthy, M. (2013). Vocabulary and Language Teaching. New York: Routledge.

- Chaarani, B., Ortigara, J., Yuan, D., Loso, H., Potter, A., & Garavan, H. (2022). Association of Video Gaming With Cognitive Performance Among Children. Jama Network. doi:10.1001/jamanetworkopen.2022.35721

- Chee, Y. S. (2016). Games-To-Teach or Games-To-Learn, Unlocking the Power of Digital Game-Based . Gaming Media and Social Effects. Singapore: Springer.

- Chilingaryan , K., & Zvereva, E. (2020). Edutainment As A New Tool For Development . INTCESS 2020- 7th International Conference on Education and Social Sciences-20-22 January- Dubai, (pp. 341-349).

- Chowdhry, A. (2017, 08 28). How Kahoot! Quickly Hit One Billion Players While Helping Advance Education. (Forbes) Retrieved 06 12, 2023, from Forbes: https://www.forbes.com/sites/amitchowdhry/2017/08/28/how-kahoot-quickly-hit-one-billion-players-while-helping-advance-education/?sh=74165f837393

- Christians, G. (2018). The Origins and Future of Gamifification. Carolina: South Carolina Honors College. Retrieved from https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1255&context=senior_theses

- Chumairok , & Ardiyani, D. (2020). Kahoot!: Alternative Learning Media in the Millenial Era. International Seminar on Language, Education, and Culture (pp. 57-61). KnE Social Sciences.

- Churches, A. (2009, 04 01). Bloom's Digital Taxonomy. Retrieved from http://edorigami.wikispaces.com

- Cloke, H. (2022, 03 15). Bloom's Taxonomy: Master Your Learning Objectives. Retrieved from growthengineering: https://www.growthengineering.co.uk/what-can-blooms-taxonomy-tell-us-about-online-learning/

- Cohen, J. (2008). Listening to learn: boosting vocabulary with interactive activities. Eric. Retrieved from https://eric.ed.gov/?id=ED501448

- Cook, A., Zheng, R., & Blaz, J. (2009). Measurement of Cognitive Load During Multimedia Learning Activities. In R. Zheng, Cognitive effects of multimedia learning (pp. 33-50). New York. USA: Information science reference.

- Coonradt, C. (2007). The Game of Work: How to Enjoy Work as Much as Play. Gibbs Smith. Retrieved from https://books.google.dz/books?id=JpnC_Nh1RAIC&printsec=frontcover&hl=ar&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

- Craig, C., Sternthal , B., & Leavitt, C. (1976, November). Advertising Wearout: An Experimental Analysis. *Journal of Marketing Research*, 13(4), 365-372. doi: https://doi.org/10.2307/3151019

- Dabbous, M., Kawtharani, A., Fahs, I., Hallal, Z., Shouman, D., Akel, M., . . . Sakr, F. (2022). The Role of Game-Based Learning in Experiential Education:Tool Validation, Motivation Assessment, and Outcomes Evaluation among a Sample of Pharmacy Students. *Education Sciences*, 8.

- Danelli, F. (2015). Implementing Game Design in Gamifi cation. In T. Reiners , & L. Wood, Gamification in Education and Business (p. 67). Switzerland: Springer.

- Davis, F. D. (1985). A Technology Acceptance Model for Empirically Testing New End-User Information Systems. Massachusetts Institute of Technology.

- Davis, F. D. (1989, September). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *JSTOR*, 13(3), 319-340. Retrieved from http://www.jstor.org/stable/249008

- Deci, E., Koestner, R., & Ryan, R. (2001). Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again. *Review of Educational Research* Vol. 71, No. 1, 1-27.

- Deignan, S. (2023, 02 20). Best Kahoot Alternatives. Retrieved October 10, 2023, from https://www.mentimeter.com/blog/stand-out-get-ahead/best-kahoot-alternatives

- Dempsey, J., Haynes, L., Lucassen, B., & Casey, M. (2022). Forty simple computer games and what they could mean to educators. *SIMULATION & GAMING*, Vol. 33 No. 2, June 2002, 157-168.

- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining gamification. . In Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments (pp. 9-15). Tampere, Finland: MindTrek'11.

- Dichev , C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International Journal of Educational Technology in Higher Education*, 22.

- Dicheva , D., Dichev, C., Agre, G., & Angelova, G. (July 2015). Gamification in Education: A Systematic Mapping Study. *Educational Technology & Society*.

- Dickinson, D., Griffith, J., Golinkoff, R. M., & Hirsh-Pasek, K. (2012). How Reading Books Fosters Language Development around the World. Child Development Research. doi: https://doi.org/10.1155/2012/602807

- digitaltechnologieshub. (2023, 04 25). TPACK model. Retrieved from www.digitaltechnologieshub.edu.au: https://www.digitaltechnologieshub.edu.au/understanding-dt/professional-learning/tpack-model/

- Durhamcollege. (2023). Educational-tech: Kahoot. Retrieved 10 17, 2023, from https://durhamcollege.ca/ctl/educational-tech/kahoot/

- Dyer, R. (2015). A Conceptual Framework for Gamification Measurement. In Gamification in Education and Business (p. 47). Switzerland: Springer International Publishing .

- East, R. (2003). Wearout, Carryover Effects and Decay of Advertising. In The Effect of Advertising and Display pp (pp. 23–47). doi: https://doi.org/10.1007/978-0-387-23377-2

- edtechreview. (2013, April 23). What is GBL (Game-Based Learning)? Retrieved from www.edtechreview.in: https://www.edtechreview.in/dictionary/what-is-game-based-learning

- Edtechreview. (2013, Marsh 20). Educator's Checklist for Game-Based Learning (GBL). Retrieved from www.edtechreview.in: https://www.edtechreview.in/elearning/gbl-checklist-for-educators/

- Education, M. o. (2018, JUly). The Official Bulletin on the National Education. Algiers, Algeria.

- Education, M. o. (2021, July). MS2 Yearly Planning Middle School English. Middle school Program Planning Guide2021. Algeria.

- Farber, M. (2017). Gamify Your Classroom. A Field Guide to Game-Based Learning. Revised Edition. New York: PETER LANG .

- Feinstein, S. (2011). The Teenage Brain and Technology. *LEARNing Landscapes | Vol. 5, No. 1*, 71-84.

- Figuccio , M. J., & Johnston, M. (2022). Kahoot! Predicts exam scores and promotes student engagement. *Journal of Research in Innovative Teaching & Learning*, 15(2), 170-177. doi: https://doi.org/10.1108/JRIT-07-2021-0051

- Forehand, M. (2005). Bloom's taxonomy: Original and revised. In M. Orey, Emerging perspectives on learning, teaching, and technology. Retrieved from https://textbookequity.org/Textbooks/Orey_Emergin_Perspectives_Learning.pdf

- Gairns, R., & Redman, S. (1986). Working with words. A guide to teaching and learning vocabulary. Cambridge, UK: Cambridge.

- Gamification. (2024, March 15). Nick Pelling: Le Créateur de la Gamification. Retrieved from Gamification Facile: https://gamificationfacile.fr/histoire-gamification/nick-pelling/

- Gates, B., & Gates, M. (2020). Our Story. Retrieved from Gates Foundation: https://www.gatesfoundation.org/about/our-story

- Gee, J. P. (2003). What Video Games Have To Teach Us About Learning and Literacy. Palgrave Macmillan.

- Gee, J. P. (2005). Good Video Games and Good Learning. Phi Kappa Phi Forum, 85(2), pp. 33-38. Retrieved from https://gamesandimpact.org/wp-content/uploads/2012/02/GoodVideoGamesLearning.pdf

- Gershon, M. (2018). How to Use Bloom's Taxonomy in the Classroom.

- GetApp. (2022, November). GetApp's Category Leaders in Student Engagement Platform. Retrieved from www.getapp.com: https://www.getapp.com/education-childcare-software/student-engagement-platform/category-leaders/

- Getapp. (n.d.). Kahoot reviews. Retrieved 06 08, 2023, from https://www.getapp.com/operations-management-software/a/kahoot/reviews/

- Goethe, O. (2019). Gamification Mindset. Switzerland: Springer. doi: https://doi.org/10.1007/978-3-030-11078-9_2

- González-Fernández , B., & Schmitt, N. (2017). In S. Loewen, & M. Sato, The Routledge Handbook of Instructed Second Language Acquisition (pp. 280-298). Routledge Taylor & Francis.

- Gravesen, J. (n.d.). Gamification-an-introduction. Retrieved November 20, 2021, from https://marketingplatform.com/gamification-an-introduction/

- Greenberg, F. (2023, September 16). When Was Kahoot Invented. Retrieved from https://robots.net/tech/when-was-kahoot-invented/

- Griffiths, C. (2008). Lessons from Good Language Learners. New York: Cambridge University Press.

- Groh, F. (2012). Gamification: State of the Art Definition and Utilization. RTMI, Institute of Media Informatics,39-46.

- Grove, J. V. (2011, July 28). Gamification: How Competition Is Reinventing Business, Marketing & Everyday Life. Retrieved from mashable: https://mashable.com/archive/gamification#jwRDwxY4Okqq

- Grove, J. V. (2011, July 28). Gamification: How Competition Is Reinventing Business, Marketing & Everyday Life. Retrieved October 2021, from www.mashable.com: https://mashable.com/archive/gamification#jwRDwxY4Okqq

- Growthengineering. (2022, 03 15). Bloom's Taxonomy: Master Your Learning Objectives. Retrieved from growthengineering: https://www.growthengineering.co.uk/what-can-blooms-taxonomy-tell-us-about-online-learning/

- Gu, P. Y. (2003). Strategies for Learning Vocabulary.

- Hao, T., Wang , Z., & Ardasheva, Y. (2021). Technology-Assisted Vocabulary Learning for EFL Learners: a Meta Analysis. *Journal Of Research On Educational Effectiveness*, 14(3), 645-667.

- Harris, S., & O'Gorman, K. (2014). Mastering Gamification: Customer Engagement in 30 Days. Birmingham, UK: Impackt publishing.

- Healey, D. (2019). Gamification. Macmillan education. Retrieved from https://api.macmillanenglish.com/fileadmin/user_upload/Blog_and_Resources/Blogs_and_articles/Macmillan-Education_Gamification.PDF

- Healey, D. (n.d.). Gamification. Macmillan education. Retrieved from https://api.macmillanenglish.com/fileadmin/user_upload/Blog_and_Resources/Blogs_and_articles/Macmillan-Education_Gamification.PDF

- Heidi, R. D. (n.d.). Learning Theories That Support Gamification. Retrieved from http://gamificationintheclassroometec533.weebly.com/learning-theories.html

- Hernández, P., Lacruz, M., Lacruz, A., Beteta, J., Azkue-, J., & Luis , J. (2021). Fostering University Students' Engagement in Teamwork and Innovation Behaviors through Game-Based Learning (GBL). *Sustainablity* , 13, 1-16. doi: https://doi.org/10.3390/su132413573

- Hetesi, S. (2021, February). A Comparative Review of Kahoot and Socrative. *The Electronic Journal for English as a Second Language (TESL-EJ)*, 4(24). Retrieved from https://www.tesl-ej.org/pdf/ej96/m2.pdf

- Hill, M. (2019, 04 16). What Is TPACK Theory and How Can It Be Used in the Classroom? Retrieved from McGraw Hill Education Canada: https://www.mheducation.ca/blog/what-is-tpack-theory-and-how-can-it-be-used-in-the-classroom/

- Hirsh , D., & Nation, P. (1992). What Vocabulary Size is Needed to Reac unsimplified Texts for Pleasure. In Reading in a Foreign Language (pp. 689-696).

- Huotari, K., & Hamari, J. (2012, October 3-5). Defining Gamification - A Service Marketing Perspective. MindTrek, p. 17.

- Hussin, A., Syed Ahmad , T., & Yusri, G. (2019). A review of learning theories for gamification elements in instructional games. Malaysian International Conference on Academic Strategies in English Language Teaching (MyCASELT) 2019, 21-22 August 2019. Malysia.

- In, J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology*, 70(6).

- Innovation, C. f. (2023). Active learning. Retrieved 10 22, 2023, from Center for Educational Innovation: https://cei.umn.edu/teaching-resources/active-learning

- Ismail, M.-A., Ahmad, A., Al-Muhammady Mohammad,, J., Fakri, N. R., Mat Nor , M. Z., & Pa, M. M. (2019). Using Kahoot! as a formative assessment tool in medical education: a phenomenological study. BMC Medical Education. doi: https://doi.org/10.1186/s12909-019-1658-z

- Ivankova, N. V. (2015). Applying Mixed Methods in Action Research. In N. V. Ivankova, Mixed methods applications in action research : from methods to community action (pp. 50-83). SAGE Publications.

- Jackson , H., & Ze´ Amvela, E. (2007). Words, Meaning and Vocabulary An introduction to modern English Lexicology (2 ed.). London: Continuum.

- Kahoot. (2013). About us. Retrieved 06 09, 2023, from Kahoot: https://kahoot.com/company/#:~:text=Since%20launch%2C%20Kahoot!%20has%20hosted,Kahoot!

- Kahoot. (2020, 05 08). Kahoot! wins best overall product in the 2020 EdTech Awards. Retrieved 10 11, 2023, from https://kahoot.com/kahoot-news/kahoot-wins-best-overall-product-in-the-2020-edtech-awards/

- Kahoot. (2021). Teacher's starter Guide to Kahoot! Retrieved from https://kahoot.com/files/2021/06/StarterGuide_0621.pdf

- Kahoot. (n.d.). Starter guide to Distance and Hybrid Learning with Kahoot! Kahoot. Retrieved from https://kahoot.com/files/2021/06/HybridLearningGuide_0621.pdf

- Kalleny, N. K. (2020). Advantages of Kahoot! Game-based Formative Assessments along with Methods of Its Use and Application during the COVID-19 Pandemic in Various Live Learning Sessions. *Journal of Microscopy and Ultrastructure*, 8(4), 175–185. doi:10.4103/JMAU.JMAU_61_20

- Kapp, K. (2012). Gamification of Learning and Instruction. Pfeiffer.

- KEBIEL, R. (2012). Thesis: Teachers' And Students'perception Of Vocabulary Learning Strategies. University of Biscra. Retrieved from http://archives.univ-biskra.dz/bitstream/123456789/4490/1/36.pdf

- Kebritchi, M. (2008). The Effects of Modern Math Computer Games on Learners' Math Achievement and Math Course Motivation in a Public High School Setting. Florida: e College of Education at the University of Central Florida.

- Khalidah, N. (n.d.). Using "Kahoot!" on Teaching Listening.

- Kim, B. (2015). Understanding Gamification. Library Technology.

- Kingsley, T., & Grabner-Hagen, M. (2017). Vocabulary by Gamification. The Reading Teacher-International Literacy Association, pp. 1-11.

- Kingsley, T., & Grabner-Hagen, M. (2017). Vocabulary by Gamification. The Reading Teacher-International Literacy Association, pp. 1-11. doi: https://doi.org/10.1002/trtr.1645

- Kralova , Z., Kamenicka , J., & Tirpakova, A. (2022). The impact of emotionally competent stimuli on language lexis retention. XLinguae, 15(3), 51-60.

- Krath, J., Schürmann , L., & Korflesch, H. (2021). Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning. *Computers in Human Behavior* 125 , 1-33.

- Kronisch, C. (2016). Gamification, Concepts and theories.

- Labed, Z. (2021). Gamifying Linguistics Courses in Non-Technological Learning Environments A Case Study. *Alkalim* Volume 06 / N°:02, 230-252.

- Landers , R., Bauer , K., Callan, R., & Armstrong, M. (2015). Psychological Theory and the Gamification of Learning. In T. Reiners, & L. C. Wood, Gamification in Education and Business (p. 216). Switzerland: Springer.

- Landers, R. N. (2015). Developing a Theory of Gamified Learning: Linking Serious Games and Gamification of Learning. *SAGE*, 2. doi:10.1177/1046878114563660

- Laufer, B. (1991). Knowing a word: What is So Difficult About It? *English Teachers Journal*, 82-88.

- Learn, U. (n.d.). Bloom's Taxonomy and Online Resources.

- LeBlanc, M. (2006). In K. Salen , & Z. Eric, The Game Design Reader: A Rules of Play Anthology (pp. 438-459). London: MIT Press.

- Legaki, N.-Z., Xi, N., Hamari, J., Karpouzis, K., & Assimakopoulos, V. (2020). The effect of challenge-based gamification on learning: An experiment in the context of statistics education. *International Journal of Human-Computer Studies- Elsevier*.

- LengendsofLearning. (2018, January 28). Blended Learning. GBL vs Gamification: What's the Difference? Retrieved from www.legendsoflearning.com: https://www.legendsoflearning.com/blog/gbl-vs-gamification/

- Lieberoth, A., & Fiskaali, A. (2021). Can Worried Parents Predict Effects of Video Games on Their Children? A Case-Control Study of Cognitive Abilities, Addiction Indicators and Wellbeing. *Frontiers in Psychology*, 11. doi: https://doi.org/10.3389/fpsyg.2020.586699

- Mala, J., Mustofa, M., & Sya, M. (2023, March). Using Kahoot! To Improve Skimming and Scanning Skills. *EDUTEC Journal of Education and Technology*, 6 (3). doi:10.29062/edu.v6i3.526

- Marczewski, A. (2015). Game thinking. even ninja monkeys like to play: gamification, game (1 ed.).

- marketingplatform. (2022, 12 17). Gamification – an introduction. Retrieved from www.marketingplatform.com/: https://marketingplatform.com/gamification-an-introduction/

- Mathew, V. (2017, April 17). Using Game-Based Learning to Increase Student Engagement. Retrieved from www.linkedin.com: https://www.linkedin.com/pulse/using-game-based-learning-increase-student-engagement-matthew/

- Mayer, R. E. (2009). Multimedia Learning (2nd ed.). CAMBRIDGE UNIVERSITY PRESS.

- McCarthy , M., & O'Dell, F. (1994). English Vocabulary in Use. Upper intermidiate & advanced. Cambridge: Cambridge Univesity Press. Retrieved from http://82.194.16.162:8080/xmlui/bitstream/handle/123456789/956/vocabulary%20in%20use.pdf?sequence=1

- McCarthy, M., O'Keeffe, E., & Walsh, S. (2010). Vocabulary Matrix. Understanding, Learning, Teaching. UK: Heinle Cengage Learning.

- McClarty, K. L., Orr, A., Frey, P., Dolan, R., Vassileva, V., & McVay, A. (June 2012). A literature review of Gaming in Education. Pearson.

- McGonigal, J. (2010, March 17). Gaming can make a better world. Retrieved from TED.com: https://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world/transcript?language=en

- McGonigal, J. (2011). Reality is Broken. New York: Penguin.

- Medjahed, N., & Taib Benabbes, F. (2021). L'apprentissage Du Fle Par Le Biais De La Gamification (Cas Des Utilisateurs Des Applications Mobiles Duolingo Etmosalingua). *Revue algérienne des lettres* Volume 5, N°2 (2021), 418-430.

- Merriam-Webster. (2022). Merriam-Webster. Retrieved October 17, 2022, from Merriam-Webster: https://www.merriam-webster.com/dictionary/gamification

- Merriam-Webster. (2022, January 08). Merriam-Webster. Retrieved from Merriam-Webster: https://www.merriam-webster.com/dictionary/vocabulary

- Mishra , P., & Koehler, M. (2006, june). Teachers College Record , 108(6), 1017–1054.

- Mitra, S. (2021). Teaching with ICT. Retrieved 04 06, 2023, from theseeproject.org: https://theseeproject.org/student-work/teaching-and-ict/

- Nation , P., & Meara, P. (2010). Vocabulary. In N. Schmitt, An Introduction to Applied Linguistics (pp. 34-52). UK: Hachette.

- Nation, I. (2001). Learning Vocabulary in Another Language. Cambridge : Cambridge University Press.

- Nation, I. (2013). Learning Vocabulary in Another Language (2nd edition ed.). Cambridge University Press. Retrieved from https://www.cambridge.org/core/books/abs/learning-vocabulary-in-another-language/series-editors-preface/E512DDF15F81DAA39D632184775F0C24

- Nation, P. (2023, 02 25). Why is vocabulary size important to measure? Retrieved from vocabularysize: https://my.vocabularysize.com/FAQ

- Nicholson, S. (2015). A RECIPE for Meaningful Gamification. In T. Reiners, & Lincoln C. Wood, Gamification in Education and Business (pp. 1-19). Switzerland: Springer.

- O'Malley, J., Chamot, A., Stewner-Manzanares, G., Kupper, L., & Russo, R. (1985). Learning strategies used by beginning and intermediate ESL students. *Language Learning*, 35(1), 21–46. Retrieved from https://onlinelibrary.wiley.com/doi/10.1111/j.1467-1770.1985.tb01013.x

- Owen, H., & Licorish, S. (2020). Game-Based Student Response System: The Effectiveness of Kahoot! on Junior and Senior Information Science Students'

Learning. *Journal of Information Technology Education*, 19, 511-553. doi: https://www.informingscience.org/Publications/4608

- Park, S., & Kim, S. (2019). A Badge Design Framework for a Gamified Learning Environment: Cases Analysis and Literature Review for Badge Design. *JMIR Serious Games |* vol. 7, 7(2). Retrieved from http://games.jmir.org/2019/2/e14342/

- Pelling, N. (2011, August 9). The Short Pre-History of Gamification. Retrieved 2022, from Nanodome: https://nanodome.wordpress.com/2011/08/09/the-short-prehistory-of-gamification/

- Pivec, P. (July 2009). Game-based Learning or Game-based Teaching? Becta, 4.

- Plass, J., Homer, B., & Kinzer, C. (2015). Foundations of Game-Based Learning. Routledge. Taylor & FrancisGroup.

- Plass, J., Mayer, R., & Home, B. (2020). Handbook of Game-Based Learning. The MIT Press.

- Prakash , E., & Rao, M. (2015). Transforming Learning and IT management Through Gamification. Switzerland: Springer.

- Prensky, M. (2002). On the horizon, Volume10, N°1, 1.

- Rasti-Behbahani, A. (2021). Why Digital Games Can Be Advantageous in Vocabulary Learning. *Theory and Practice in Language Studies*, 11(2), 111-118.

- Richards , J., & Schmidt, R. (2002). Longman Dictionary of Language Teaching and Applied Linguistics- Third Edition. PEARSON EDUCATION LIMITED.

- Richter, G., Raban, D. R., & Rafa, S. (2015). Studying Gamification: The Effect of Rewards. In T. Reiners, & L. C. Wood, Gamification in Education and Business (p. 23). Switzerland: Springer International Publishing.

- Rigby, C. S. (2014). g a m i f i c a t i o n a n d m o t i v a t i o n . In S. e. Deterding, The Gameful World. Approaches, Issues, Applications (p. 119). Cambridge, Massachusetts: The MIT Press.

- Ritter, J. (2015, June 25). Gamification or Game-Based Learning? What's the Difference? Retrieved from https://www.kdplatform.com: https://www.kdplatform.com/gamification-game-based-learning-whats-difference/

- Rivero, V. (2020). The Edtech Awards 2020: Finalists & Winners. Edtechdigest. Retrieved 10 11, 2023, from https://www.edtechdigest.com/2020-finalists-winners/

- Rosen, J. (2013, December 28). Gamification' helps make learning, earning more fun. Retrieved from www.tennessean.com: https://www.tennessean.com/story/news/2013/12/29/jj-rosen-gamification-helps-make-learning-earning-more-fun-/4236043/

- Rosyada, A., & Apoko, T. (2023). Investigating English Vocabulary Difficulties and its Learning Strategies of Lower Secondary School Students. *JOLLT Journal of Languages and Language Teaching*, 11(3). doi: https://doi.org/10.33394/jollt.v%vi%i.8404

- Ruffcorn, G. (2021, 03 02). Teacher Tips Pulse Checks Kahoot. Retrieved 10 22, 2023, from Kahoot.com: https://kahoot.com/blog/2021/03/02/teacher-tips-pulse-checks-kahoot/

- Rusticus, S. (2014). Content Validity. In Encyclopedia of Quality of Life and Well-Being Research. Springer, Dordrecht. doi: https://doi.org/10.1007/978-94-007-0753-5_553

- Ryan, R., & Deci, E. (January 2000). Self-determination theory and the Facilitation of Intrinsic Motivation, Social Development and Well-being. *American Psychologist* Vol.55 N , 68-78.

- S. Detering, D. Dixon, R. Khaled, L. Nacke. (September 2011). From Game Design Elements to Gamefulness: Defining Gamification. MindTrek'11, (pp. 9-15). Tampere, Finland.

- S. Kim, K. Song, B. Lockee, J. Burton. (2018). Gamification in Learning and Education. Switzerland: Springer.

- Sailer , M., Hense, J. U., Mayr, S. K., & Mandl, H. (2013). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. ELSEVIER, 373.

- Salen , K., & Zimmerman, E. (2004). Rules of Play: Game Design Fundamentals. The MIT Press .

- Salen , K., & Zimmerman, E. (2004). Rules of Play: Game Design Fundamentals. The MIT Press.

- Sarnou, D. (2020). Questioning The Significance Of Technologizing Algerian Schools And Universities: Did It Fail Or Succeed? *International Journal on Integrating Technology in Education (IJITE)*, 9(1).

- Schmitt, N. (1997). Vocabulary Learning Strategies. In N. Schmitt, & M. Mccarthy, Vocabulary: Description, Acquisition and Pedagogy. Cambridge: Cambridge university press.

- Schmitt, N. (2007). Current Perspectives On Vocabulary Teaching And Learning. In J. Cummins, & C. Davison, International Handbook of English Language Teaching (Vol. 15, pp. 827-841). Springer.

- Schmitt, N. (2010). Key Issues in Teaching and Learning Vocabulary. In R. Chacón-Beltrán, C. Abello-Contesse , & M. Torreblanca-López, Insights into Non-native Vocabulary Teaching and Learning (pp. 28-40). Multilingual Matters.

- Seaborn, K., & Fels, D. (2015). Gamification in theory and action: A survey. ELSEVIER. *International Journal of Human-Computer Studies*.

- Shaffer, D., Squire, K., Halverson, R., & Gee , J. (2005). Video Games and the Future of Learning. WCER Working Paper No. 2005-4. Retrieved from t http://www.wcer.wisc.edu/publications/workingPapers/index.php

- Shernoff, D. (2013). Introduction: Towards Optimal Learning Environments in Schools. In D. Shernoff, Optimal Learning Environments to Promote Student Engagement (pp. 1-24). Springer.

- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the New Reform. Harvard Educational Review, 57(1). Retrieved from https://d1wqtxts1xzle7.cloudfront.net/30505333/shulman-libre.pdf?1391861638=&response-content-disposition=inline%3B+filename%3DKnowledge_and_teaching_Foundations_of_th.pdf&Expires=1714237370&Signature=dqrVaBNeu7g-uT~V519KmIxtutE0PeMFk6pJkEH6wcQ59dLuA~n3Eu

- Shulman, L. S. (2007). Counting and Recounting: Assessment and the Quest for Accountability. Change: The Magazine of Higher Learning, 39(1), 20-25. doi:10.3200/CHNG.39.1.20-25

- Singer, N. (2016, April 16). Kahoot App Brings Urgency of a Quiz Show to the Classroom. Retrieved 10 26, 2023, from https://www.nytimes.com/2016/04/17/technology/kahoot-app-brings-urgency-of-a-quiz-show-to-the-classroom.html

- Singh , N. C., & Duraiappah, A. (2020). Rethinking learning: a review of social and emotional learning frameworks. New Delhi: UNESCO MGIEP.

- Singh, M. K., Ganapathy, M., & Lin, D. (2019). Kahoot!: Enhancing creativity in classroom Learning. In S. Abdul rahman, M. Shuib, & G. Crosling, Creativity in Education. Malysia.

- Sinnivasagam, P., & Hua, T. (2023). Gamification Functionality and Features of Kahoot! in Learning—ESL Teachers and Students' Perceptions. *Open Journal of Social Sciences*, 11, 404-421.

- Sómer, M. M., Moreira, J., & Casado, C. (2021, July). Use of Kahoot! to keep students' motivation during online classes in the lockdown period caused by Covid 19. *Education for Chemical Engineers*, 36, 154-159. doi: https://doi.org/10.1016/j.ece.2021.05.005

- Tatas, H., Anggraheni, D., & Yogatama,, A. (2022). Kahoot as An Alternative Interactive Learning Media in the Digital Era. ELTLT 2021, August 14-15, *Indonesia. Semarang*. doi:DOI 10.4108/eai.14-8-2021.2317628

- teacheracademy. (2020, July 02). Game-Based Learning: What Is It? GBL vs Gamification: Types and Benefits. Retrieved from www.teacheracademy.eu: https://www.teacheracademy.eu/blog/game-based-learning/

- teaching, M. (2020, June 14). Guide to The Revised Bloom's Taxonomy. Kensington : Model Teaching. Retrieved from https://modelteaching.com/wp-content/uploads/2020/06/Blooms-Taxonomy-Guide.pdf

- thesparklewritershub. (2016, 12 21). WORD OF THE DAY. Retrieved from thesparklewritershub: https://thesparklewritershub.wordpress.com/2016/12/21/wordoftheday-you-can-guess-what-this-word-means/

- Toma , F., Diaconu, D., & Popescu, C. M. (2021). The Use of the Kahoot! Learning Platform as a Type of Formative Assessment in the Context of Pre-University

Education during the COVID-19 Pandemic Period. Education Sciences. doi:

https://doi.org/10.3390/educsci11100649

- Truscott, J. (2022). Working Memory and LanguageE in the Modular Mind.

    Routledge.

- UNESCO. (2017). Education for Sustainable Development Goals: Learning

    Objectives. Paris, France. Retrieved from

    https://unesdoc.unesco.org/ark:/48223/pf0000247444/PDF/247444eng.pdf.multi

- University, U. (n.d.). Retrieved from

    https://www.utica.edu/academic/Assessment/new/Blooms%20Taxonomy%20-

    %20Best.pdf

- V. M. Cojocariua & I. Boghian. (2014). Teaching the Relevance of Game-Based

    Learning to Preschool and Primary Teachers. Procedia. Social and Behavioral

    Sciences, 2.

- Vnucko, G., & Klimova, B. (2023). Exploring the Potential of Digital Game-Based

    Vocabulary Learning: A Systematic Review. Systems.

- Walker, E. (2016, Dec). Opportunities for Innovation: Game-based Learning in an

    Engineering Senior Design Course. Clemson: Tiger Prints. Retrieved from

    https://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=2806&context=all_disserta

    tions

- Walker, K. (2011, JAn 02). Immediate Feedback to Students and Students Learning.

- Wang, A. I. (2015, March). The wear out effect of a game-based student response

    system. *Computers & Education*, 82, 217-227. doi:

    https://doi.org/10.1016/j.compedu.2014.11.004

- Wang, A. I., & Tahir, R. (2020, May). The effect of using Kahoot! for learning – A literature review. *Computers & Education*, 149. doi: https://doi.org/10.1016/j.compedu.2020.103818

- Wang, A. I., Zhu, M., & Sætre, R. (2016). The Effect of Digitizing and Gamifying Quizzing in Classrooms. 10th European Conference on Game Based Learning, (pp. 729-737). Retrieved from https://ntnuopen.ntnu.no/ntnu-xmlui/bitstream/handle/11250/2426374/2016_Wang_ECGBL-Effect_of_digitizing_and_gamifying_quizzing.pdf?sequence=3

- Wen , Z., Teng , M., Han, L., & Zeng, Y. (2022). Working Memory Models and Measures in Language and Bilingualism Research: Integrating Cognitive and affective perspectives. Brain Sciences. Retrieved from https://www.mdpi.com/2076-3425/12/6/729

- Werbach , K., & Hunter, D. (2012). For The Win: How Game Thinking Can Revolutionize Your Business. Philadelphia: Wharton Digital Press.

- Wilkins, D. A. (1972). Linguistics in Language Teaching. Massachusets: MIT Press. Retrieved from https://archive.org/details/linguisticsinlan0000wilk/page/n7/mode/2up?view=theater&q=without+vocabulary%2C+nothing+can+be+conveyed

- Willis, J. (Autumn 2011). Nurturing Students' Brains for the Future. *LEARNing Landscapes* | Vol. 5, No. 1, 259-265.

- Wilson, L. O. (2001). Anderson and Krathwohl – Bloom's Taxonomy Revised: Understanding the New Version of Bloom's Taxonomy. The Second Preinciple. Retrieved from https://intranet.ecu.edu.au/__data/assets/pdf_file/0010/772867/Understanding-the-New-Blooms-Taxonomy-Wilson-2016.pdf

- Xu, Y. (2014). Lexis and Teaching. International Conference on Education, Language, Art and Intercultural Communication (ICELAIC 2014) (pp. 268-270). Antlantis Press.

- Yip, F. W., & Kwan, A. C. (2006). Online vocabulary games as a tool for Teaching and Learning English Vocabulary. *Educational Media International*, 43(3), 233–249. doi:10.1080/09523980600641445

- Yu, A., & Trainin, G. (2022, 12 27). A meta-analysis examining technology-assisted L2 vocabulary learning. ReCall, 34(2), 235 - 252. doi: https://doi.org/10.1017/S0958344021000239

- Yürük, N. (2020). Using Kahoot as a skill improvement technique in pronunciation. Journal of Language and Linguistic Studies, 16(1), 137-153. Retrieved from https://dergipark.org.tr/en/download/article-file/1031840

- Zaric, N., Roepke, R., Lukarov, V., & Schroeder, U. (2021). Gamified Learning Theory: The Moderating role of learners' Learning Tendencies. *International Journal of Serious Games* V.8 Issue 3, 71-91.

- Zhang, P., & Graham, S. (2019). Vocabulary learning through listening: Comparing L2 explanations, teacher codeswitching, contrastive focus-on-form and incidental learning. Language Teaching Research, 24(6), 765-784. doi: https://doi.org/10.1177/1362168819829022

- Zichermann , G., & Linder, J. (2013). The Gamification Revolution. McGraw-Hill Education.

- Zimmerman, G. (2014, 02 25). TedX Vilinius: The Future of Creativity and Innovation is Gamification. Retrieved 2020, from Youtube: https://www.youtube.com/watch?v=ZZvRw71Slew

- Zwier , L., & Boers, F. (2023). English L2 Vocabulary Learning qnd Teaching: Concepts, Principles, and Pedagogy. Routledge. DOI: 10.4324/9781003172994-13

- Zwier, L., & Boers, F. (2023). English L2 Vocabulary Learning and Teaching. Concepts, Principles, and Pedagogy. New York,: Routledge.

Appendices

1. Teachers' Interview

Awareness

1. What do you know about GAMIFICATION and game-based learning?

2. Do you use ICT tools when teaching? Example ?

3. at which stage of the lesson (pre-during-post) do you use games?

4. Do you use game in teaching? What type of games (serious, fun or digital games?

5. To what extent do you believe Gamification gets learners engaged?

Competence

1. Do you use online forums to interact with your learners? Name some

2. *Cake* is a video-based learning application, how would you use it to teach about shopping?

3. with your class in mind which type of game element is efficient and suited to your class learning style? LEVEL – Rewards – Badges - RULES – Challenges – Competition –timer or goals

4. When you select games, what influences your selection and decision?

Experience

1. With your class in mind how comfortable you feel about using games/ and or digital games in class (or out of the class)? Which game is more efficient

2. What barriers do you face when using games?

3. How are you likely to suggest gamification to your professional environment?

4. If you are to recommend, what application would you choose?

5. Do you think that EFL program should include gamification? Why?

2. **Post-test and Delayed Post-test**

Vocabulary Assessment (Post-test and Delayed Post-test)

School Year: 2022/2023

Level: Middle School 2nd year   CLASS: …………

Sequence Four: Me and My Travels

Lesson I: I listen and do / Weather

- **Choose the right answer**

1- **'th' in Weather is pronounced**:   a-/ θ /   b-/ δ /

2- **Choose the right spelling**:

a- Cdoul   b- Cold   c- Cloud

a-Rain   b-Rian   c-Raine

a-Strom   b-Storm   c-Smort

a-Sanny   b-Suny   c-Sunny

3- **Use the map on p130 and write the weather forecast as shown in the example:**

Example: *Tomorrow, the sky will be **cloudy** in Laghouat, Djelfa and El-Oued*

1- (Algiers)…………………………………………………..

2- (Bechar and Tindouf)……………………………………………………………….

3- (Annaba)………………………………………………………….

3. **Authorisations from the Education Board**

<div dir="rtl">

مستغانم 17 أفريل 2023

إلى السيدة مديرة مديرية
التربية لولاية مستغانم

الموضوع: طلب رخصة إجراء دراسة ميدانية

لي الشرف، سيدتي، أن أتقدم إلى سيادتكم بهذا الطلب و المتمثل في منح الطالبة بودور خديجة رخصة إجراء دراسة ميدانية في **مؤسسة كعييش محمد** ماسرى ولاية مستغانم، وذلك غرض إنهاء بحث علمي المتمثل في أطروحة دكتوراه. كما أفيدكم علما بأن الطالبة السالفة الذكر مسجلة سنة خامسة دكتوراه تخصص **الليسانيات التطبيقية و التكنولوجيا الجديدة** بجامعة عبد الحميد بن باديس – كلية اللغات الأجنبية ، قسم اللغة الانجليزية تحت رقم 2701202218077061229DUN.

في رد إيجابي على مراسلتنا، سيدتي، تقبلوا منا فائق التقدير و الاحترام.

الإمضاء

</div>

الجمهوريـــة الجزائريـــة الديمقراطيـــة الشعبيـــة
People's Democratic Republic of Algeria

وزارة التعليم العالي و البحث العلمي
Ministry of Higher Education And Scientific Research
University Abdelhamid Ibn Badis Mostaganem
جامعة عبد الحميد بن باديس مستغانم

Réf. 62../FLE/UMAB/2023

ATTESTATION

Je soussigné Pr. Houari BELLATRECHE, Doyen de la Faculté des Langues Etrangères, atteste que Mme BOUDOUR Khadidja née le 17/11/1989 à Oran, inscrite en Doctorat troisième cycle dans la filière langue anglaise, spécialité Linguistique Appliquée et Nouvelles Technologies, a besoin d'effectuer des recherches de terrain, dans le cadre de la préparation de sa thèse, au niveau de l'établissement scolaire Kouibich Mohammed à Mesra.

Mes vifs remerciements pour l'aide qui lui sera accordée.

Fait à Mostaganem, le 1 8 أوت 2023

Le Doyen

الأستاذ : بلاطرش هواري
عميد كلية اللغات الاجنبية

ولايــــة مـــستغـــانـــم
مـديــريـة التــربــيـة
مصلحة التكوين و التفتيش
مــكتــب التــكــويــن
رقـــــم : ٨٨٨ /20.20 /2023

17 أفريل 2023

مستغانم في:

مديرة التـربـية
إلـــى
السيــد: مديـر متوسطة
كعبيش أحمد
- ماسرة -

الموضوع : ترخيص لإجراء دراسة ميدانية .

يشرفـني أن أطلب منكم السماح للطالبة :

- بودور خديجة.

بإجـراء دراسة ميدانية بالمؤسسة التي تشرفون عليها .

تخصص : الليسانيات التطبيقية و التكنولوجيا الجديدة .

وذلك ابتداء من : 2023/04/18 .

مديـرة التـربـيـة

عن مديرة التربية و بتفويض منها
الأمين العام
جبور عبد القادر