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The Role of Personalized-Game-Based-Learning Approach in Enhancing EFL Learners' Vocabulary Learning and Psychological Health

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Dedication

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Abstract

Traditional language learning methods endorse standardized content where all the diverse learners absorb vocabulary input in an obstinate and like manner. The one size fits all approach presents vocabulary in a stagnant learning environment as learners have to spend hours on the same seat absorbing all kind of input. However, one size never fits all, therefore personalized-games-based learning (henceforth, PGBL) approach emerged to offer a malleable content in the form of personalized games. This research foremost objective is to inspect the impact of PGBL on learners' vocabulary learning and learners' psychological health (emotional and mental health). Furthermore, this study aims to assess PGBL's potency in increasing learners' motivation and attention and fostering a healthy supportive learning environment. To ascertain PGBL merits in educational settings, we surveyed EFL learners, English teachers, and educational psychologists from different high schools. A mixed-methods approach design was chosen to collect both qualitative and quantitative data from the different participants through binary data collection instruments, namely questionnaires and interviews. The results brought light to the manifold benefits of the PGBL approach. The findings denote that PGBL is cogent in facilitating vocabulary processing and retention in learners' memory. All along with that, PGBL induces positive emotions and happy hormones as it hampers negative emotions and inhibition for shy and intrinsic learners. In the same way, PGBL increases students' motivation and maintains their interest and attention. Ergo, the study concluded that the PGBL approach promotes a safe and friendly EFL-classroom environment.

Keywords: Personalized-games-based-learning approach, personalized games, vocabulary, psychological health, emotional health, mental health, motivation, attention.

List of figures

List of tables

Table of contents

Chapter one: Literature review

Chapter two: Methodology

Chapter three: Interpretation of Findings, Recommendations and Limitations

General introduction

Learners differ in the way they perceive, store, and process data. They are diverse in their speed of learning and level of aptitude. Each learner has a different learning style and a different type of intelligence. For example, some learners are more verbal, while others are numerical, visual, auditory, or kinesthetic and they escape stagnation. However, traditional ways of teaching do not respect learners' diversity as it reaches learners through a standardized approach, which makes the classroom boring and data processing slow. In a traditional language classroom, learners spend hours stagnant where they merely absorb information without understanding by dint of the incongruity between the learner's learning style and the way the teacher presents the content. Along with that, in foreign language learning, having enough vocabulary is considered imperative to reach fluency.

In this regard, a new approach has emerged, personalized-games-based-learning approach (henceforward, PGBL), that advertises malleable content and a fun healthy learning environment. PGBL approaches learners with personalized games that conform to learners' differences and needs as it facilitates vocabulary learning and provides personalized assistance as a means of promoting a friendly academic setting.

The source of motivation for this research is my teaching experience in Istanbul, Turkey where I had to teach the English language for EFL learners using personalized games. I noticed that learners enjoyed and acquired more vocabulary when using personalized games. Over and above, learners memorized vocabulary effortlessly and rapidly, and even shy and intrinsic learners were happily engaged in the learning process. In addition, the learning environment was more active and fun, even me, the teacher, I was having fun teaching.

The purpose of the study is to assess the PGBL approach' qualifications in assisting EFL students' vocabulary learning and promoting a healthy learning atmosphere. Furthermore, the study aims to get an in-depth understanding of the impact of PGBL on learners' psychological health in educational settings from a psychological perspective. Moreover, this study determines the potency of the PGBL approach in increasing learners' motivation and attention. At last, the final objective of this research is to compare PGBL approach's qualifications in improving learners' performance with the traditional way of teaching.

This research paper is a pursuit of veracity and validity that aims to answer the following question: how does PGBL impact EFL learners' vocabulary learning and learners' psychological health?

As an attempt to answer the above question, the following hypothesis is proposed: PGBL has a positive effect on EFL learners' vocabulary learning and psychological health and well being. Throughout this reasoning set of sub-questions were elicited:

1- To what extent does PGBL facilitate vocabulary learning for EFL learners?

2- Does PGBL have a positive impact on learners' psychological health and well being?

3- Does PGBL increase learners' attention and motivation?

4- Does PGBL promote a healthy and supportive learning atmosphere?

Accordingly, the following sub-hypotheses were suggested:

1- PGBL promotes vocabulary acquisition as it eases vocabulary processing in learners' brains

2- PGBL maintains a safe, supportive, and healthy environment.

3- PGBL evokes positive feelings, which abates stress level and alleviates anxiety.

4- PGBL aids learners to be more focused and attentive, and it increases motivation.

The theoretical foundation of this research paper topic is based on three fundamental theories and perspectives: educational, cognitive, and psycho-neurobiological. Different scholars have taken part in building the theoretical base of this research. The educational theories are attributed to Richard Snow and Lee Cronbach in addition to Scott Thornbury. The cognitive theories are advised mainly by Jean Piaget and Lev Vygotsky. Additionally, the psycho-neurobiological perspectives and theories are introduced by the professors James E. Zull and Russell Poldrack.

This research adopts a mixed-method approach design as it integrates both quantitative and qualitative. The data are gathered through binary data collection tools, scilicet questionnaires, and interviews. For the aim of increasing validity and credibility, the sample selected includes EFL learners, English teachers, and educational psychologists from different high schools. Two different questionnaires are shared with teachers and EFL learners to have rich insights into the PGBL approach in educational settings. By the same

token, an interview will be conducted with educational psychologists to get a comprehensive understanding of the PGBL approach impacts on learners' psychology, well being and learning.

This research paper is divided into three chapters. The first chapter advertised the theoretical overview of the research topic. To begin with, the chapter reviews vocabulary definition, importance in language learning along with the different methods of teaching vocabulary. Furthermore, the games-based-learning approach definition and importance are discussed along with its efficacy in teaching and learning vocabulary. Moreover, personalized learning historical background and definition are delineated thoroughly. Thereafter, a comprehensive account of personalized-games-based learning approach definition and importance is given from cognitive and psychoneurological perspectives. After that, The efficacy of the PGBL approach in teaching vocabulary is advertised besides games' design and types. The last part of the chapter discusses the teacher's role when implementing personalized games in the classroom.

The second chapter gives an overview of the research methodology. First, the research type and design are discussed along with the methodology. After that, the chapter discusses the type of sampling method, and a comprehensive account of the different selected participants is reported. Moreover, a thorough description of the data collection instruments definition and types are given. The final part depicts the data analysis and the different results are reported in graphs and charts.

The third chapter epitomizes the final results of each data collection instrument separately. Along with that, the chapter discusses and interprets all the data together, thoroughly, under headings in the form of the important results that answer the research questions. After that, the different limitations that hampered the progress of the data collection process are described. Aftermost, the chapter elucidates a set of recommendations that may improve personalized games' efficacy and that need to be taken into account when implementing games. Along with that, future research directions are delineated.

Chapter one:

Literature review

1.1 Introduction

This chapter brings to light the theoretical foundation of the personalized-game-based-learning approach (henceforth, PGBL). Firstly, this part of the study highlights vocabulary definition and importance in foreign language learning. Then, it sheds light on educational games' efficacy in teaching vocabulary after giving an overview of the old methods of instructing vocabulary. Thenceforth, a brief review of personalized learning history and definition is given to pave the way to a discussion about the PGBL approach's potency in teaching and learning vocabulary and making the classroom environmentally-friendly. More particularly, the discussion is tackled from an academic, cognitive, and psycho-neurobiological perspective. The discussion is concluded with examples of some effective personalized games and how the teacher should employ them successfully.

1.2. Vocabulary

1.2.1. History of vocabulary teaching

When structural linguistics and audiolingualism were at the peak of fame, vocabulary importance was marginalized for many years. Before the emergence of CBA (communicative based approach) and CLT (communication language teaching), traditional methods gave particular importance to syntax and morphological features (Darfilal, 2014). Thus, "vocabulary teaching has traditionally taken a back seat to grammar teaching" (Pirrie, 2017, p. 9). Grammar was the principal subject of language teaching; it was taught solely, while vocabulary was taught within lessons of speaking, reading, listening, and writing (Darfilal, 2014). It was believed that structure and rules are the assets for language learning. Therefore, vocabulary was receiving little to no attention.

Vocabulary teaching was given a secondary position, although "lexis is the core or heart of language, but in language teaching, it has always been the Cinderella" (Lewis, 1993, p. 89). Ergo, grammar was classified as the central concern of language teaching and learning. However, According to Thornbury (2002), the attention devoted to vocabulary increased in the 1970s with the emergence of the communicative approach, "the appearance of the lexical syllabus, and the realization of the importance of lexical chunks supported by findings from corpus linguistics" (Pirrie, 2017, p.9). A high awareness was raised about the significance of vocabulary teaching for language proficiency. The idea of mastering the system of language

for meaning negotiation has taken another direction because many scholars start to believe that "without vocabulary, nothing can be conveyed" (Wilkins, 1972, p. 111).

Accordingly, Wilkins (1972) as cited in Darfilal (2014, p. 4) also claimed that "you can say very little with grammar, but you can say almost anything with vocabulary." Scholars recognized the importance of vocabulary and made it "one of the language components measured in language tests'' (Schmitt, 1999, p. 189). Although grammar is "the skeleton of the language", scholars agreed that vocabulary is "the vital organs and flesh" (Harmer, 1991, p. 153) to stress its necessity for the mastery of language. As believed by many (Laufer, 1997; Wilkins, 1972), vocabulary is a potent tool for clear, effective communication. Thus, the more extensive is the learner's vocabulary, the more he can be understood, and he can understand others (Fowers, 2000, as cited in Darfilal, 2014).

1.2.1. Vocabulary definition

The Oxford dictionary (2007) as cited in Darfilal (2014) defines vocabulary as the body of words used in a particular sphere and as the total number of words that make up a language. Neuman and Dwye (2009, p. 385) defined vocabulary as "words we must know to communicate effectively", terms used for speaking and expressing one's thought, and words used for comprehension and listening. According to Hornby (1995), vocabulary is the number of words that constitutes a language and "a list of words with their meaning" (Bakhsh, 2016, p. 3). Vocabulary is also defined as the sum of words that are used by the speaker (Burns, 1972). Ur (1998) as cited in Alqahtani (2015) described vocabulary as the number of words taught in a foreign language class**.** Furthermore, Diamond and Gutlohn (2006) referred to vocabulary as the knowledge of words and their meaning (as cited in Alqahtani, 2015).

Vocabulary can vary in form and number of words it contains. Some vocabulary is made of more than one single word such as "post office, and mother-in-law...but they express one single idea" (Alqahtani, 2015, p. 5). As well as, vocabulary has two forms: oral and print; oral refers to words recognized when listening or speaking, and print refers to terms known when reading and writing (Darfilal, 2014). In brief, vocabulary represents the cornerstone of language without which meaning can not be conveyed, as it can be defined as the epitome of words that describe a particular language.

1.2.3. The importance of teaching vocabulary in language learning

For many years, vocabulary was recognized as having paramount importance in language learning. As claimed by Schmitt (2000), vocabulary teaching is imperative to foreign language learning because it leads to real communication. The latter indicates that inadequate and insufficient vocabulary hamper speaking proficiency, which is thought fundamental for successful language learning.

Effective communication does not result from learning a never-ending list of grammatical rules, but rather from having adequate vocabulary knowledge (Cook, 2011, as cited in Pirrie, 2017). August, Carlo, Dressler, and Snow (2004) agreed that limited vocabulary knowledge makes learners less capable of understanding text and less involved in oral communication, which leads to slow improvement in foreign language learning. Thus, learners must have an ample vocabulary for effective communication.

According to Hedge (2000), vocabulary errors can mislead learners' understanding more than grammatical errors can do. Hence, vocabulary accuracy is more important than grammatical correctness as language learning is significantly ascribed to extensive vocabulary knowledge (Macis & Schmitt, 2017).

Lee (2009) as cited in Khan et al (2018) undertook a research study to investigate the factors that affect and influence English language learning of 6 EFL Korean graduate learners in an American institution. After four months, the results indicated that insufficient vocabulary, in addition to other reasons, hinders learners' speaking fluency. Instructors and learners claimed that inadequate vocabulary impedes language proficiency. Ergo, vocabulary knowledge is considered as a "vital indication of language proficiency" (Schmitt, 2008, as cited in Khan et al, 2018, p. 3).

Krashen (1989), as cited in Lewis (1993, p. 25) stressed the fact that learners "carry dictionaries with them, not grammar books" to communicate in a foreign language, which refers to the indispensability of vocabulary learning. Rivers and Nunan (1991) assert that vocabulary is crucial for the mastery of second language learning because it helps learners using the structures and functions learned (as cited in Alqahtani, 2015). As well as, Padak a vocabulary expert asserted that "There's a strong, statistical link between a person's

vocabulary knowledge and students' comprehension ability; and there's a robust link between these two and academic success" (as cited in Varlas, 2012, p. 1). Yet more and more researchers are investigating the role of vocabulary learning in language learning proficiency.

Many studies confirmed the benefit of pre-teaching vocabulary before reading in helping learners comprehend the text studied better. Wang (2005) surveyed 99 Chinese students in a university, where he taught one group vocabulary before reading and the other group after reading. The group who received vocabulary instruction before reading outperformed the group who had vocabulary instruction after reading. Therefore, it is appropriate to say that "vocabulary is predominant in improving one's communicative skill" (Beena, 2011, p. 1) and comprehension skill.

Teachers use different methods to instruct new vocabulary words to learners. Each method is diverse in the way it presents input and the way it approaches learners, which impacts the degree of its effectiveness.

1.2.4. The different methods of teaching vocabulary

Myriad efforts have accentuated the importance of teaching vocabulary in language classes. Research in language teaching strives to find the most appropriate way to instruct vocabulary. Traditional methods advocated the use of literal translation from native language to foreign language such as Grammar Translation Method, memorizing a list of words, memorizing dialogue, question/answer practice, substitution drills (Richards, 2010, as cited in Benoit, 2017). Notwithstanding, Bromley (2007) argued that the "overuse of dictionary hunting, definition writing, or teacher explanation could turn students off learning new words and does not necessarily result in better comprehension or learning" (p. 532). Other researchers advocated the use of translation in the vocabulary learning process due to its ease in explaining abstract concepts such as awareness, pleasure, and wit (Pirrie, 2017). However, Scrivener (2015) (as cited in Riahipour & Saba 2012, p.1259) asserts that the use of a never-ending list of vocabulary along with their translation does not promise long-term retention.

Researchers in foreign language teaching agreed that there are two distinct ways of acquiring vocabulary: incidental and intentional (Calderón, 2007; Carlo et al., 2004; McKeown & Beck, 2004; Soltani, 2011, as cited in Benoit, 2017). The former refers to

learning vocabulary through reading and listening, while the latter refers to learning vocabulary through explicit instruction such as repetition and memorization (Soltani, 2011). Hubband et al. (1983) as cited in Darfilal (2014) claimed that vocabulary must be taught in a more "memorable way" (p. 50) in context, through practice, and revision (Darfilal, 2014).

According to Foil and Alber (2002), for successful vocabulary acquisition, learners must be able to make an association between new vocabulary and previous knowledge, form new relevant contextual situations, and regularly use different methods to practice new words(as cited in Benoit, 2017). Thus, they recommended the use of games as the most suitable method for effective vocabulary acquisition. Games provide ample opportunities for repetitive exposure and interaction with words and context, which leads to excellent vocabulary retention (ibid). However, translation as a method of teaching vocabulary "lost ground to the communicative approach" in the late 20th century (Koletnik, 2012, as cited in Pirrie, 2017, p. 6).

Ergo, it was agreed that games are one of the best ways of instructing vocabulary in language classes due to their significant impact on students' learning and psychology, especially today's learners.

1.3. Game-based-learning approach relevance for nowadays' generations

The 21st century, the digital age, induced education to veer from blackboard instruction to touch-sensitive-screens instruction. Today's learners have grown up in an era where technology invaded every corner and aspect of life. Thus, they are fed up with learning through explicit instruction using traditional methods such as repetition, translation, and memorization (Uberman, 1998). This passive learning is leading to little to no learning outcomes because it does not meet their digital needs.

These computer generations, as called "screenagers" by (Pivec, 2009, p. 5) have a different way of thinking and different needs than the old generations because they are adapted to a digital environment where computers are often replacing books. Studies have shown that university students spend 5,000 hours of their lives reading books while they spend 10,000 hours of their life playing games (Prensky, 2001). In 2001, Prensky as cited in Pivec (2009) used the term "digital natives" (p. 5) to refer to university graduates to highlight the idea that these generations have a love for digitality by nature, as they were born to use computers.

"Hole in the Wall" is a project by Mitra and Rana in 2001 to confirm the notion of digital natives. They set up computers in different locations in India, where technology never had the chance to exist. They invited children without any previous knowledge on how to use computers, and they were not provided with any guidance or training. However, these children excelled in using computers, as they succeeded in surfing the internet, downloading movies, playing video games, saving files, and conforming to Prensky's expectations and others. As well as, both genders were found to engage in game playing with an estimate of 99% of boys and 94% of girls (Joiner et al., 2011).

In addition to digital nativism, children, in general, have a short attention span, and this deficit spawns the feeling of boredom and hyperactivity (Harmer, 2001 as cited in Bakhsh, 2016), which makes learning unbearable for both learners and teachers. On that account, learners must be involved in engaging activities with a "variety of content, design, and player modes" (Al-Razgan & Alotaibi, 2019, p. 3). Therefore, education should support the use of games because "children love to play games and are highly motivated to engage with them" (Kinzie & Joseph, 2008, p. 643). Games are indisputably a suitable fit in education because they promote nowadays' learners' needs and educational outcomes.

1.3.1. Definition of Games

Many definitions were forged by different scholars to answer the question: what is a game? Games are a type of edutainment, which refers to any media or material that aim at both education and fun (Sfiri, 2015). They can be both informal and enjoyable. In order words, games are "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (Salen & Zimmerman, 2004, p. 80). Games can take a form of physical activities or mental quizzes, which are played according to predefined rules to meet specific learning outcomes (Mat Zin & Wong, 2008).

Educational games' preeminent focus is to amplify knowledge and to soothe the learning process. According to Byrne (1995), Games are a system of play "governed by rules" (p. 21), that are mostly employed in language classes to encourage language use through play and amusement (as cited in Darfilal, 2014). El Shamy (2001) contended that games are a form of competition between learners, in which there are rules to follow to overcome the predefined challenge to meet the expected goals. In other quarters, It was posited by Benoit (2017) that games are a paradigm of play driven by a set of regulations to accomplish a task, and reach

the learning outcomes. On top of that, games provide ample opportunities to use language, increase knowledge, and develop new dexterities to guarantee successful language learning.

Game-based-learning (henceforth, GBL) is an approach to learning and a method of teaching through the use of games. This approach has a set of rules to respect and a strategy to follow to reach specific learning outcomes and to meet learners' needs (Benoit, 2017). According to EdTechReview (2014), this approach was "designed to balance subject matter with gameplay and the ability of the player to retain and apply said subject matter to the real world" (para. 1). Games put language into context through educational play activities, which provides learners with endless opportunities for vivid learning experiences. Over and above, Shaffer, Squire, Halverson, and Gee (2005) described game-based-learning as a "personally meaningful, experiential, social and epistemological" (p. 105) approach. The aforementioned scholars elucidated the assortment within GBL, where learners can have a personalized experience adjusted to meet learners' needs and learning goals.

Phit Huan et al. (2007) as cited in Mat Zin and Wong (2008) professed that game-based learning is a model of teaching by way of games and play to devolve knowledge in a more accessible, effective, and euphoric way. This explains the bafflement between play merely for fun, and learn through play, which expresses the bidirectional tenets and principles of educational games. Otherwise stated, game-based-learning is a model of teaching through role-playing, in which the content is in the form of rules, options, and corollaries (Perrotta, et al., 2013). Besides, it engages learners in experiential learning, where they learn through trial and error (Ibid). To sum things up, GBL is a paradigm of teaching that approaches learners in a more fun way but still knowledgeable and refined in content. In addition to that, GBL is often confused with the gamification approach that differs in some aspects.

1.3.2. The Difference between game-based-learning and gamification

Gamification is a broad term, and more recent than GBL, in which games' elements such as "points, badges, leaderboards, competition, achievements" are employed in non-game situations (Perrotta et al., 2013, p. 10). On the other hand, GBL is a way of teaching where games are used to convey meaningful content. Moreover, gamification is the "process of using game thinking and mechanics to engage audiences and solve problems" (Zichermann, 2010, 3:30) without the use of games themselves. In other respect, gamification duplicates the mechanism of games in non-game content, which refreshes the activities, gives it a new taste, and gets the learners out of the routine (Sfiri, 2015). On the flip side, the GBL main focus is

on the use of games mainly as an approach to teach; however, it has the same learning ramifications as gamification.

To shun the entanglement between gamification and GBL, Kapp (2012) contended that gamification is the use of "game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems" (p. 10). In different words, gamification is a way of attracting learners' attention, motivating them, and sparking their curiosity through the use of games' incentive systems and other games' elements (Jan, et al., 2015). In a few words, gamification is the use of games' features, design, mechanism, system, and structure merely, instead of using games wholly, which stands for game-based-learning approach.

1.3.3. The importance of educational games in teaching vocabulary

The use of games in teaching vocabulary is of a paramount calibre in English language classes by virtue of the delectation, motivation, and creativity it imbues learners with (Bakhsh, 2016). It makes language learning void of reluctance, fear, or anxiety, which reinforces students' engagement. Ragatz (2015) asserted that game-based-learning leads to successful vocabulary acquisition because learners can retrain vocabulary and use it in different contexts. Likewise, according to Hui-Chan and Chen (2012), GBL facilitates the acquisition of vocabulary, and it consolidates vocabulary in memory because successful vocabulary learning beseeches repetitive exposure and rehearsal of words, which is displayed effectively by GBL approach (Sadeghi & Sharifi, 2013).

Myriad efforts and research studies explored the positive contribution of games in vocabulary instruction (Taheri, 2014). Honarmand and Rostampour (2015) have undertaken a research study to probe the contribution of games in acquiring vocabulary using Tic Tac Toe and Flashcards. Fifty beginners have participated as they were divided into two groups: control and experimental group. The control group was taught using traditional instructions. However, the experimental group was taught using the Tic Tac Toe game and flashcards. The results revealed that games have a vital role in improving vocabulary acquisition for beginners.

Moreover, Aslanabadi and Rasouli (2013) conducted a study to explore the effect of games on vocabulary acquisition of Iranian EFL kindergarten learners. Students were divided into experimental and control groups. The control group was taught using the traditional

method of teaching. However, the experimental group was taught using online language games. The results indicated that games enliven the learning ambience and make it more enjoyable and interesting. Besides, games motivate learners and increase their confidence. In one of the studies, a learner said, when the game is " more enjoyable and active. You never get bored as in traditional teaching because you concentrate on a goal. This helps you to retain elements in your memory easily and understand concepts that are difficult to advance in the game" (Papastergiou, 2009, p. 10).

Over and above, to probe how games affect vocabulary acquisition, Smith et al (2013) brought two groups of 57 students from a Chinese University to undertake a pre-post-test to determine their vocabulary acquisition progress when using games and without games. The students were divided into experimental and control groups. The experimental group used computer games and online text, while the control group was taught using a long list of vocabulary, multiple-choice questions, and a hard-paper text. At the end of each session, they took a post-test to assess their progress. After four sessions (two-session using games and two sessions using the traditional way of teaching), the results of the post-tests highlighted the gap in performance between the control group and the experimental group. The experimental group outperformed the group who were taught using the traditional method. As well as, the learners who played games were highly motivated and engaged in the task compared to the control group (as cited in Benoit, 2017).

The central concern of this research study is to investigate personalized educational games efficacy in assisting vocabulary learning. Therefore, after reviewing educational games' potency in facilitating vocabulary learning, this part of the chapter expounds personalized learning and personalized educational games' importance in educational settings.

1.4. Personalized learning

1.4.1 A Historical Overview

The term personalized learning was used back in the early 1960s, which implies that before the 19th century, many efforts attempted to personalize the learning content to conform to learners' needs (Brown, 2019). In 1880, school administration in Pueblo, Colorado, presented a new approach to teachers where learners learn at their own pace ("New Classrooms," 2014). However, the plan was impeded because of the paucity of learning materials (Ibid). In 1968,

Fred Keller proposed a Personal System of Instruction (PSI), also called the Keller Plan (Ibid). It encourages learners to approach the content at their own pace, in which the curriculum was divided into units whereby at the end of each unit, there was a formative assessment to assess learners' progress (Ibid).

In 1978, The press of Harvard University published Lev Vygotsky's work in English on the Zone of Proximal Development (Brown, 2019). The latter explains how learners' needs could be reached in mixed abilities and a diverse learning styles classroom with the help of a more qualified adult to provide learners with advanced knowledge, partly above their lever, an (i+1) knowledge (Krashen, 1985). In 2009, Joel Rose and Chris Rush added a new part to the New York City Department of Education called the School of One (Brown, 2019). School of One was the first endeavour to adapt what, where, when, and how learners learn according to their skills through the use of technology ("New Classrooms," 2014).

Many teachers, lawmakers, politicians, and others have supported the development of personalized learning in classrooms by creating local departments and new teaching procedures (Brown, 2019). Also, in 2017, the notorious Mark Zuckerberg, Bill Gates, and their wives invested a lot of effort and an estimate of 12 million dollars to support personalized learning and adapting education to learners' needs and differences (Ibid). Currently, the personalized learning approach is still a compelling method of teaching that is mundanely adopted and sanctioned.

1.4.2. Definition of Personalized learning

There has been a unanimous agreement that personalized learning is a fluctuant approach that responds to different learners' characteristics throughout the learning process, and it supports learners' agency (Groff, 2017). Taylor and Gebre (2016) opined that personalized learning offered a differentiated instruction that proceeds in accordance with learners' pace and needs, and it conforms to students' differences. Withal, personalized learning is the urge to adjust learning environments to reach learners' needs, preferences, capacities, and "the different ways students achieve their best" to develop their competences ("A National," 2014, p. 4).

Furthermore, personalized learning tailors the teaching approach and the syllabus to conform to students' learning requirements (Ibid). According to Murphy, Redding, and Twyman (2016), personalization refers to the relationship between the teacher, the students, the students' family, the learning materials, and the different methods and instructions used to

help learners improve their potential. Bill & Melinda Gates (2010) defined Personalized Learning:

> Personalized learning seeks to accelerate student learning by tailoring the instructional environment—what, when, how, and where students learn—to address the individual needs, skills, and interests of each student. Students can take ownership of their learning, while also developing deep, personal connections with each other, their teachers, and other adults. (as cited in Groff, 2017, p. 5)

The fundamental core concepts in Personalized Learning is learning styles, types of intelligence; and learners' needs, aptitude, and interests, which can be traced back to Aptitude-Treatment-Interaction (ATI) theory: research by Richard Snow and Lee Cronbach's (1976) that proposes adjusting teaching to fit learners' differences (Cronbach and Snow, 1977)

In ATI, each letter stands for an educational concept. A refers to aptitude, which is students' speed of assimilation, different skills, abilities, and personality traits. T: stands for treatment: is the kind of instruction, method, and approach followed in the classroom. I: interaction between the teacher and the student, between the student and the learning materials, and between the students and the environment (Schunk, 1996).

ATI refers to the difference in learning ramifications (learners' behaviour, achievement, success, or failure) due to the interaction between learners' differences and the kind of instruction given by the teacher (ibid). In other words, ATI research studies learners' attitudes as a result of interaction between the type of teaching the teachers are offering to satisfy students' different needs.

Ample research strove to pigeonhole learners into categories according to the way they approach the learning content. Learning styles theories and learners' differences studies were a leading point. According to Sampson and Karagiannidis (2002), the most prominent efforts in the area are the Myers-Briggs Type Indicator (Keirsey, 1998); Multiple Intelligences (Gardner, 1999), (Jasmine, 1997); Auditory, Visual, Tactile/Kinaesthetic Learning Styles (Sarasin, 1998); Grasha-Riechmann student Learning Style Scales – GRLSS (Grasha, 1996); Kolb Learning Styles Theory (Kolb, 1985); Felder and Silverman Index of Learning Styles (Felder, 1996); Honey and Mumford Learning Styles (Honey and Mumford, 1992). Learning styles are the preferred way to each learner in the way he/she approaches educational content,

in which the learner collects, stores, organizes, and retrieves information successfully (Chick, 2020). It is each learner's comfort zone in which he/she achieves the best results. Neil Fleming's VARK learning styles model (1987) is a famous representation of the four learning styles: V: visual, A: auditory, R: reading/writing, K: kinesthetic (Cherry, 2019).

In short, in personalized learning, a teacher should be able to accurately identify learners' differences and adjust the teaching approach accordingly. The personalization of content can take many forms. The teacher can personalize games to reach each learner through a play-fun approach.

1.5. Personalized-game-based-learning approach

Games are easily tailored to learners' previous knowledge, age, needs, and interests (Darfilal, 2014). Moreover, according to Dicheva, Dichev, Agre, & Angelova (2015), games are by nature personalized in content and instruction to each learner due to its miscellaneous design in form, colours, and knowledge presentation, which engages learners and strengthens their comprehension. In like manner, educational games automatically provide a sample of content personalization that "scaffolds each student's learning and fosters self-direction to help each individual achieve mastery of knowledge and skills" (Redding, 2014, p. 6).

Personalized-game-based-learning is an approach that combines both personalized learning and learning through educational games. In PGBL, games are designed and customized to cater to students' differences that are studied by their teachers through diagnostic tests, learning styles tests, observation, and asking learners about their needs and interests (seeking the what and the why) (Djoub, 2019). The teacher's role in this approach is to make learning and teaching about learners, to make it their own, and about their life, interest, and needs, only (Zull, 2012). In more detail, the instructor should cater to students' characteristics after having learners undertaken diagnostic tests, observing learners' interaction and engagement, and learning about their interests, dreams, and hobbies (Djoub, 2019). The teacher has to contrive his instruction, tasks, and assessments to dovetail to learners' needs and preferences. Correspondingly, learners will own the learning environment as it turns around their differences and inclinations (Zull, 2012).

1.5.1.The importance of Personalized-game-based learning approach in education

The significance of personalized games is discussed from different perspectives, namely education, cognitive, and psycho-neurobiological perspectives:

1.5.1.1.The importance of PGBL from an educational perspective

Games are of a potent eminence in the educational settings. According to Garzotto (2007), as cited in Mat Zin and Wong (2008, p. 3), four factors stress games' importance and effectiveness: "usability" (they are easy to use), content (goal-oriented, scaffold-ed and, extensibility), entertainment (competition, challenge, immediate feedback), social interaction (cooperation, and competition). Anent to language learning and acquisition, it is often tough, boring, and unpleasant when it is full of stagnation and rote memorization. Harmer (2008) claimed that English language acquisition requires comprehensive knowledge about the target language features, properties, and rules. Most importantly, it requires varied personalized instruction.

Learning in a personalized, real-world context makes learning more vivid and fun, which reinforces the desire to learn (Beena, 2011). Beena (2011) also opined that: "Experience, observation, reflection, and testing in new situations...are the keys to the meaningful learning process." (p. 4) because all of this leads to a vivid involvement in the learning context. Perkins and Salomon (1989) as cited in Jan et al (2015) proclaimed that successful language learning requires two main ways: low road and high road. The former stands for automatic repetition of context and skills; the latter stands for conscious abstraction and application of knowledge. Both of which reinforce the transfer of learned materials to a new context (Ibid). Games, on the other hand, pave the way for both low and high roads by providing ample opportunities for repeated learning and language application, which leads to an abstraction of knowledge.

Many investigators as G¨obel, Wendel, Ritter, and Steinmetz (2010), professed that it could be a hellacious educational experience if teachers would consider tailoring the learning experience to conform to learners using interactive technological devices and designs as PGBL approach. Furthermore, the traditional way of teaching, the one size fits all approach has lost its ground for PGBL because learners differ in their needs, learning pace and educational level, which requires personalized instruction (Al-Razgan & Alotaibi 2019).

On the flip side, in PGBL, learners have the privilege to study at their own pace, matching their preferred learning styles. In more words than one, personalized educational games give learners the choice and the voice. According to Zull (2002), any "active learning that involves choice and actions by the learner is pleasurable and effective for developing concepts and applications" (p. 80).

According to SM silvers (1982), as cited in Egounleti (2018), games are merely used as a "break from the monotony of drilling" (p, 5) to wet the dryness of repetition and memorizing. Notwithstanding, Peirce et al (2011) clarified that games are not merely a means for fun to eliminate boredom, however, games "cater for dynamic learner attributes" (p. 3) because they automatically personalize teaching instructions. Also, games have a miscellaneous design and content (Ibid), which according to Gardner (1999) games stimulate different types of intelligences: visual and auditory (videos, images), kinesthetic (movement, physical action), verbal (narrative text), interpersonal (group work, peer cooperation). To that end, a personalized system offers different learning experiences to each learner considering their needs and characteristics (Jung & Graf, nd), which implies that each learner will learn where he/ she feels comfortable.

Quantitative research found that learners who learn through the PGBL approach put conscious efforts into learning as they are persistent and attentive with a higher sense of success and achievement (Al-Razgan & Alotaibi, 2019). Moreover, personalized games "make learners use the language instead of thinking about learning the correct form'' (Lee, 1979, p. 2, as cited in Egounleti, 2018), which implies that games encourage the flexible use of language rather than forcing learners to think what grammatical rules to use to sound correct. As a result, learners will be able to communicate freely and overcome the fear of making mistakes.

Barab, Warren, Ingram-Goble, Kim, Park, & Baek (2009) upheld that play in the educational environment motivates learners to develop different skills such as goal-setting skills, self-monitoring, self-regulation, and self-assessment (as cited in Jan, et al., 2015). However, Pivec (2009) conducted a study on educational games and concluded that games do not necessarily prosper learning as they do not develop any cognitive skills and knowledge in learning. Also, he claimed that games only motivate learners to carry on making efforts (Ibid). Schlimme (2002) disproved Pivec (2009) as he claimed that games present ample opportunities for learners where they can discuss the content and negotiate an understanding

of different conceptions, which improves learners' "reading, spelling, and spatial abilities and critical-analyzing techniques." (as cited in Vahdat & Rasti- Behbahani, 2013, p. 62).

According to Wright, Betteridge, and Buckby (1997) "games can be found to give practice in all the skills (reading, writing, listening, and speaking), and for many types of communications (e.g., encouraging, criticizing, agreeing, explaining" (p. 1). Besides, personalized educational games provide learners with the opportunity to practice the target culture in different contexts (Alyaz & Genc, 2016). In addition, personalized games open the doors for learners to discover and get in touch with a multiplicity of cultures, which magnifies their intercultural awareness and intercultural communication competence (Guillén-Nieto & Aleson-Carbonell, 2012).

Personalized-Games-Based-Learning approach offers learners the opportunity to make "graceful failure" (Jan, et al., 2015, p. 268). As a result, it encourages learners to participate, take the risk, build on previous knowledge, and explore new ways of learning (Hoffman & Nadelson, 2010). Games engage all the students, even those who are not involved in the activities (non-players), as they concentrate on players and often perform the same physical movements (Jan L.et al., 2015). Researchers agreed that observers (non-players) learn more from watching than players do (Dehaan et al., 2010) because they can repeat what was observed, which consolidates knowledge in their memory.

Bakhch (2016) maintained that when playing games, learners become too excited, talkative, active, and eventually, the teacher loses control. Also, Toth (1995) reported some teachers' reviews about applying games in teaching: "the children get too excited, and then they do not listen to my instructions." (p, 8). He added that "I have too many children in my class to control the language they are using." (Ibid) . Accordingly, the classroom becomes less organized, and learners' participation will be in the form of noise and havoc. However, Gee (2007) insisted that the teacher's way of employing games can either wane its efficacy or increase it, and it is the teacher who guarantees games' success (Kenny & Gunter, 2011; Koh, Kin, Wadhwa, & Lim, 2012).

Learners, especially the young ones, are exceptionally active and less attentive than adults (Harmer, 1991). Before engaging learners in games, the instructor has to set rules, instructions, and punishments. Besides, the teacher has to organize students into small manageable groups so he can easily manage the classroom. Therefore, "if the teacher does

not take an active role when facilitating the game, and there is no purpose for using the game, then the learning will be ineffective" (Ulicsak & Williamson, 2010, p. 39).

1.5.1.2.The importance of PGBL from a cognitive perspective

A large number of studies prove the positive effect of educational games on human cognition. Games regulate play so that learners "build new cognitive structures and ideas of substance" (Klopfer et al., 2009, p. 5, as cited in Sfiri, 2015). In further details, Games aid the brain to process words through several cognitive processes: storing (first encounter), consolidation (second encounter, replay), and retrieval (use for the next task), which strengthen words in memory and facilitate its process for future retrieval (Scrivener, 1994, as cited in Darfilal, 2014). This implies that the Games' design works in accordance with brain structure, which facilitates input assimilation in academic settings.

More comprehensively, cognitivist elucidated that when playing personalized educational games, a learner selects the input intended to learn and processes it through either a visual, auditory morality or other senses according to the learner preference. After that, they store it in the working memory for assimilation (Darfilal, 2014). After that, they link the new input with the previous one for accommodation (Mayer, 2014), which bolsters cognitive processing, fosters learning and promotes educational success (Delacruz, 2012) (as cited in Jan et al., 2015).

According to Thornbury (2002), "The more decisions the learners make about a word, and the more cognitively demanding these decisions, the better the word is remembered" (p. 25), which implies that educational games are an appropriate approach to teach vocabulary. Besides, Robertson and Howells (2008) as cited in Mat Zin and Wong (2008) claimed that play is a "mental workout" (p. 561) that reinforces learning muscles because games ascend cognitive abilities, memory, and analytical skills. Besides, it helps learners convalesce some learning disabilities (Klingberg, Forssberg & Westerberg, 2002, as cited in Pivec, 2009) and diseases as Alzheimer (Korczyn, Peretz, Aharonson & Giladi, 2007).

Piaget (1962) as cited in Jan et al (2015), in his theory of children's cognitive development, claimed that play takes part in children's development as it activates their schemata and helps them transfer knowledge into real situations to go beyond "immediate reality" (Jan L. et al., 2015, p. 259). Piaget clarified the importance of play in learners' cognitive development and games' automaticity in making learners use the knowledge gained

at school in real-life situations. Vygotsky (1978) as cited in Jan et al (2015, p. 260), as well, holds that games are a "leading factor" because it creates a Zone of Proximal Development for learners where they can learn from play with the help of a more skilful instructor. Hence, it helps learners construct knowledge and go beyond their abilities (Jan, et al., 2015, p. 2). Vygotsky (1978) as cited in Jan et al (2015) explained that games allow learners to learn in a social, educational environment where they learn from each other and cooperate to actively construct knowledge, which conveys that games by nature create social learning that leads to learners' cognitive development.

1.5.1.3.The importance of PGBL from a Psycho-neurobiological perspective

Dr Zull is a neurobiologist who strove to understand learners' brain's biology and neurology. In his discursive book " *The Art of Changing the Brain*" (2002), he elucidated that the more we take learning away from learners, the more we demolish its potency (Zull, 2002). He opined: " people learn when they believe it is about their life-their life!" (Ibid, p. 248). Dr Zull (2002) explained how the human brain is the same in function, but each brain has a specific area or modality he enjoys processing input through. Therefore, learners enjoy learning via different senses: each learner contributes differently to learning and offers something associated with his preferable pattern (Ibid).

Each learner is gifted differently than his other peers (Ibid). The teacher's approach must be appropriately adapted to this diversity in gifts. All of the gifts should be fitted into the learning cycle. The teacher should invite the learner to use styles that differ from his to engage different parts of his brain (Ibid), which eventually deepens and strengthens his learning as the brain makes great progress when the one uses the part of the brain he/she enjoys (Ibid).

Many psychological studies highlight the significance of matching learners' personality with the learning environment because it develops productivity and positive emotions (Kristof, 1996). Furthermore, A 2001 brain imaging study by Poldrack and colleagues Showed that any learning that is learner-centred as PGBL engages learners' basal structure (pleasure centres). Recent studies proved that the more pleasure neurotransmitter the brain releases as serotonin, dopamine, the more the number of synapses increases, which produces activity in the brain, increases input processing, and eventually knowledge formation (Zull, 2002). Along with that, movement and physical actions help learners pay more attention and get engaged in long period tasks (Bakhsh, 2016).

In more words, Amato (1988) expounded that "games can lower anxiety, thus making the acquisition of input more likely" (p. 147). As a result, it gives learners the chance to put their feelings and thoughts into words or actions without feeling inhibited (Hansen, l994, as cited in Egounleti, 2018). Moreover, games have the power to dwindle inhibition and reticence since Abdikhah (1998) declared that when playing games timid learners who have no will to raise their hands and participate will feel stress-free and judgment-free. Furthermore, the atmosphere of the game is inherently motivating due to its spontaneous activities, variety of content: narrative text, videos, images, colours, and shapes (Peirce & Wade, 2011), which encourages learners to make more effort to enhance their progress and performance.

The anatomy of the brain suggests something about learning, action, and pleasure. The frontal cortex is an action cortex (where the motor cortex is located). Deep Down the frontal cortex, there are brain structures responsible for happiness, pleasure, and all positive emotions called the basal structures (Zull, 2002). It was found that these basal structures responsible for pleasure get activated when they anticipate action (when action is generated or when the one simply thinks about the movement) (Ibid). For example, one feels pleasure when dancing, eating, talking, practising sport, making sex, or playing (Ibid). All the different pleasures include movement. Jensen (2001) as cited in Pivec (2009) surmised that physical movement while learning enlarges neuronal networks in the brain, which increases learners' creativity and flexibility in thinking because they gain the power of interleaving between thoughts and ideas. However, when movement is confined, it evokes the feeling of torture and torment. For this reason, criminals go to jail (Zull, 2002). Therefore, traditional stagnant learning where students stay still on their seats for four hours straight is considered to harm learners' psychological health.

One of the most ignored information in education is that humans learn through emotions. Affective factors have a preeminent role in learning, especially in memory. They can either enhance it or wane it (Jan et al., 2015). Theories such as the differential emotions theory (Izard, 2007), the control value theory of achievement emotions (Pekrun, 2000), and the integrated cognitive-affective model of learning with multimedia (Plass & Kaplan, 2015) accentuated the strong association between cognition and emotion in the learning context (Jan et al., 2015). Plass & Kaplan (2015) undertook research on emotions that proved that games' mechanisms arouse positive emotions, which impacts learning positively.

Moreover, Izard (2009) explained that emotions have substantial and measurable effects on cognition and learners' action, especially when they are in a critical learning situation. In more detail, The amygdala, a brain region responsible for processing emotions such as fear and anger, and plays a role in storing emotional memories, has several connections with other brain areas responsible for memory, perception, reflection, and idea formation (Zull, 2002). Most of these connections travel from the amygdala to the cortex and not the opposite (Ibid). This indicates that emotions have a potent role in affecting memory and learning. Le Doux (1996) suggested that emotions "overpower" cognition and not the opposite (as cited in Zull 2002 p. 91), which implies that human emotions influence their thinking, and eventually, their learning more than the opponent does. Thus, promoting positive emotions is of great necessity when teaching.

Researchers in psychology investigated the different emotions evoked by game design: the form of content, colours, and shapes (Jan et al., 2015). They found that round shapes and warm colours promote positive emotions that increase understanding, knowledge transfer, and reinforce learning (Um et al., 2012). They have concluded that both warm colours and round shapes strengthen understanding; however, warm colours can not enhance knowledge transfer without the availability of rounded shapes, while round shapes alone can do it (Ibid). According to King (2019), playing games evoke positive emotions, which induce hormones responsible for happiness such as:

Serotonin is a neurotransmitter that controls feelings of happiness and well being, which affects mood, memory, and learning, when the brain releases more serotonin, as in play, creativity, memory, and positive behaviour increase (Ibid).

Dopamine and Endorphins are hormones and neurotransmitters in the prefrontal cortex that ferries signals between brain nerve cells. The body releases Dopamine and Endorphins when the one exercises, feels pleasure or satisfaction from achievement, sports, play, and anything related to action. Dopamine is known to increase motivation, and they are also called painkillers because they reduce the feeling of pain and wane the feeling of discomfort (Ibid).

Sobhani and Bagheri (2014) undertook a study about PGBL with different stakeholders in education and learners. Instructors claimed that games are "learning lubricant" (p. 1066), which mitigates any sinister feelings such as anxiety, anger, stress, fear, frustration,

nervousness, and threat. PGBL provides learners with a comprehensive sensory experience since it presents different sensory input through images, colours, music, videos, and forms, which may fire old networks (previous knowledge) (Zull, 2002). When the teacher triggers learners' schemata, it helps them build on new knowledge, strengthen understanding, and consolidate learning. Moreover, Several experiments show that sensory experience changes neurons' activity in the brain (Ibid).

Marian Diamond (1964) undertook an experiment on baby rats. She raised two groups of baby rats in two different environments. The first environment is rich in sensory input: things to see, things to touch, and things to hear. The other environment is void of sensory input: less rich and less complex. The baby rats raised in the enriched environment their neurons in the cerebral cortex were more stimulated, active, and fired more frequently. Therefore, new dendrites branched out and grew, which formed new synapses and enlarged the neuronal network that eases the reception of new input (effective learning). However, in less complex environments, the synapses were weak, and some became silent because the neurons were less active and less fired (as cited in Zull 2002).

A rich sensory experience, as in PGBL, encourages the brain to fire new neurons and create new networks (Ibid). This change at the level of the brain is labelled brain plasticity (Ibid). The bottom line is that neuroscience has proved that learning and teaching through games can change brain structure in a way that facilitates learning.

In each classroom, it is inevitable to find learners with ADHD disorders, which is 5% out of each schoolroom (Pivec, 2009). Young learners are often recognized as being hyperactive with a short attention span. It is all-natural because, at a younger age, children use their physical actions such as touch, and play to discover what surrounds them. Personalized games provide learners with multiple ways of communicating knowledge using hands, gestures, mime, body movement (Rixon, 1981), which can be of great benefit for learners with ADHD, and it sustains their attention for a more extended period of learning.

In the same respect, a study by Rutherford, Nicolson, and Arnold (2006) as cited in Pivec (2009) was conducted on 895 subjects with ADHD. The participants had 10 minutes of physical exercise twice a day. It was found that symptoms of short attention span and hyperactivity were reduced by 60%. It was suggested that physical movement activates the cerebral cortex responsible for attention and concentration, as well as, it increases blood

circulation and then oxygen delivery. In brief, physical movement improves concentration and attention, which are prerequisites for educational success (Pivec, 2009). Personalized games' efficacy in foreign language learning is portrayed in various language aspects such as vocabulary learning.

In brief, psychological investigations in academic settings accentuate the importance of considering learners' differences and learners' emotions in teaching, which, in other words, supports the adoption of the PGBL approach.

1.5.2. The efficacy of integrating PGBL in vocabulary learning

Many studies have confirmed the PGBL approach's effectiveness in teaching vocabulary by virtue of its vigour in Consolidating "lexical items" (Darfilal, 2014, p. 2). However, Alneyadi (2007) claimed that the use of games in teaching vocabulary is seldom trusted in academic settings. Notwithstanding, Virginia French Allen (1983) as cited in Egounleti, (2018), in her book "*Techniques in Teaching vocabulary*", explained how vivid experience is the best vocabulary instructor because when playing games, learners encounter new target words, which develops their vocabulary bank (Schlimme, 2002, as cited in Vahdat & Rasti-Behbahani, 2013). Also, repetition in games is automatic. Therefore, vocabulary will be strengthened in learners' memory in a less boring but more amusing atmosphere (Bakhsh, 2016).

In this respect, Boumová (2008) affirms that PGBL provides a healthy atmosphere where learners can easily conform to instructions' requirements and learn about new words' meaning, pronunciation, spelling, synonyms, antonym, connotations, position in the sentence. Moreover, Games are a more useful tool in consolidating vocabulary in working memory, as Thornbury (2002) explained:

> To ensure long-term recall and retention, new knowledge should be integrated to old/existing knowledge, i.e., they need to be placed into working memory, e.g., being compared, combined, matched, sorted, visualized, and re-shuffled, as well as being repeatedly filed away and recalled. (p. 45)

Personalized games can exhibit the latter due to their ability in activating learners' mind as they allow students "to pause and think about the words" and decide "whether to compare, contrast, match or draw pictures which represent them" (Alneyadi, 2007, p. 3). Ample

research stressed the effectiveness of the PGBL approach in teaching vocabulary for the reason that it facilitates the process of strengthening words in memory, and it creates a fun, supportive learning environment.

On top of everything else, to enhance personalized games' efficacy, the teacher should consider the way games are designed and created to meet students' differences appropriately.

1.6 Game's design

Game design should cover all the four skills (listening, speaking, writing, and reading) and all the different students' learning styles (Darfilel, 2014). Besides, games have to have some kinetic energy to refresh the classroom and increase attention among learners when they feel tired and bored (Ibid). Marc (2015) set six principles to design educational games. They should be :

> (1) be provocative of critical thinking via one or more problem states; (2) be appropriately challenging (similar to Vygotsky's zone of proximal development); (3) provide opportunities for players to discover and/or create their knowledge; (4) provide a fictional world or fantasy-driven metaphor; (5) be "social" (i.e., encouraging collaborative interactions between players); and (6) be winnable (so as to provide goals, as well as some sense of competition). (p. 3)

Moreover, Effective games should not be extremely challenging, which disheartens learners, and not remarkably easy, which discourages learners (Csikszentmihalyi, 1990, as cited in Jan et al, 2015). However, games' challenge should be within the students' zone of proximal development (Bruner, 1985) so that the teacher provides learners with feedback that scaffolds their understanding of games mechanism, and promotes learning success (Jan al., 2015). Games should have "the sweet spot," where learners can solve the problem but merely with a taste of struggle and skirmish (Csikszentmihalyi, 1990 as cited in Jan et al, 2015, p. 260).

When designing games, the teacher should plan for the appropriate challenge, the appropriate response, and the relevant feedback, which are considered as the three key elements in game design (Jan al., 2015). Also, games' rules should be few, clear, and easy to understand (Darfilal, 2014) so that learners face fewer difficulties while playing games (Ibid). Accordingly, Perrotta (2013, p. 17) gave an idea about how the games' mechanism should be. It should have:

1. "Rules": they differ in complexity depending on the learning outcomes and objectives.

2. "Goals": they should be clear to understand and challenging (not too easy and not too difficult).

3. 0A fictional setting": the context of games should have a fascinating flow and background so learners can play a fictional role that is reflected in real life.

4. "Progressive difficulty level": games' difficulty should gradually increase from one level to another.

5. "Interaction and a high degree of student control": the mechanism of games support the notion of "agency." Students should be given the choice and the voice to own their learning.

6. "A degree of uncertainty and unpredictability": the game should proceed unpredictably in a way that the learner will feel curious about what is coming next, which increases attention and reinforces the principle of fun.

7. "Immediate and constructive feedback": feedback should aim at supporting and scaffolding learners' performance, it should be in the form of guidance

8. "A social element": games should provide a cooperative environment where learners learn and construct knowledge together.

Each game is diverse in form and objectives. The teacher should choose the appropriate types of games that satisfy all learners' needs and goals.

1.6.1. Types of games

Games differ in design, and each design aims at different learning outcomes. Wright and his colleagues (2006) as cited in Pirries (2017, p. 16) classified games firstly depending on the students' " mental processes, which take place while playing the game: a) care and share; b) do: move, mime, draw, obey; c) identify: discriminate, guess, speculate; d) describe; e) connect: compare, match, group; f) order; g) remember and create". Accordingly, Lewis and Bedson (1999) as cited in Pirries (2017, pp. 16-17) also classified games, however, their classification is based on games' conspicuous characteristics: "movement games, card games, board games, dice games, drawing games, guessing games, role-play games, singing and chanting games, team games, and word games." Therefore, teachers have to diversify the type of games they implement to reach each student where he/she feels comfortable.

Storytime: suggested by Alyaz and Geng (2016).

The teacher will group learners in a group of 5 members. Then he will ask each group to pick ten previously learned vocabulary. Each group should not have more than four common words with the other groups. The teacher will ask each group to write a story (with a moral) out of the vocabulary they chose. The group that will have the most impressive and inspiring story, their story will be played by the kinesthetic group. This game meets linguistic and kinesthetic learners' needs.

Crossword: suggested by (Darfilal, 2014).

This game is in the form of a grid in a square form of white and black squares. Learners have to fill the white squares with letters to form a word or a phrase after solving a puzzling statement, an image, or a video. It is beneficial for learners with a sequential learning style (They prefer to learn by sequence: step by step)(Khamisi, 2013) and for visual learners.

Taboo: suggested by (Darfilal, 2014).

Each student will come to the board and suggest a word. The other classmates, by turn, have to give a verbal explanation. Then, the game will be played the way around, where a learner has to provide a verbal explanation, and his peers have to guess the word. This game makes learners' understanding of concepts more flexible, which increases their fluency level.

I draw it, you guess it (Pictionary): suggested by ("10 Games," 2019)

In each classroom, we may have students who are brilliant in drawing. Students who can draw will be part of the different groups. From each group, the student who can draw will be invited to the board so that the teacher gives him a vocabulary word he has to draw. The members of his group have to guess what word the teacher said. This game brings great joy to learners with drawing skills as it conforms to their interests.

If there are only a few learners who can draw, they can work in collaboration with the teacher. The teacher will suggest the word, they draw it, and the rest of the classroom has to guess it.

Educational games do not function spontaneously without teachers' guidance. to ensure games' effectiveness, the teacher needs to apply a set of practical techniques and provide careful assistance to learners.

1.7. The teacher role

Bakhch (2016) maintained that when playing games, learners become too excited, talkative, active, and eventually, the teacher loses control. Also, Toth (1995) reported some teachers'

reviews about applying games in teaching: "the children get too excited, and then they do not listen to my instructions" (p. 8). He added, "I have too many children in my class to control the language they are using" (Ibid). Accordingly, the classroom becomes less organized, and learners' participation will be in the form of noise and havoc. However, Gee (2007) insisted that the teacher's way of employing games can either wane its efficacy or increase it, and it is the teacher who guarantees games' success (Koh, Kin, Wadhwa, & Lim, 2012). Therefore, "if the teacher does not take an active role when facilitating the game, and there is no purpose for using the game, then the learning will be ineffective" (Ulicsak & Williamson, 2010, p. 39).

Before implementing games, the teacher should have a comprehensive understanding of his learners' differences, attitudes, and interests to decide what game to bring to accommodate each learner's characteristics and needs (Bakhsh, 2016). First and foremost, vocabulary is never taught in a vacuum (Djoub, 2019). Therefore, teachers should always put games in a context to reinforce meaning. Also, The teacher has to see if the chosen game fits learners' age, level, abilities, cultural background, interests (Lightbown & Spada, 1999), and the lesson's learning outcomes and objectives (Sfiri, 2015). The teacher should see to what extent the game is challenging, and he should not pick games that are inappropriately challenging (Lightbown & Spada, 1999). Furthermore, the teacher has to make a balance between the number of vocabulary to be learned, the type of game, time, the extent of using learners' native language, and the effort to make (Bakhsh, 2016).

Before bringing the game to the classroom, the teacher should play the game and invite others to play it to assess its efficacy and use (Sfiri, 2015). Also, before playing games, students should be given a comprehensive explanation and a detailed instruction about the game, the target vocabulary (ibid), and the games' learning outcomes and objectives (Hays, 2005; Sitzmann, 2011, as cited in Kapp, 2016).

In the end, the teacher should plan for a session in which he/she will reflect on learners' performance and progress (Bakhsh, 2016). The teacher's feedback helps learners assess their progress and see to what extent they have achieved the lesson's objectives and what vocabulary was learned (Hays, 2005; Sitzmann, 2011).

1.8. Conclusion

This chapter outlines the theoretical part of this research. The first part of the work discussed vocabulary definition, importance in foreign language learning, and the different methods

used to teach vocabulary. The second part expounded the games-based-learning approach's definition, its relevance for today's generations and for teaching vocabulary, and the difference between games-based-learning and gamification. The third part gave an overview of personalized learning and personalized-games based learning. Furthermore, this part discussed the importance of PGBL from an educational, cognitive, and psycho-neurobiological perspective. After that, the chapter denotes the PGBL approach's efficacy in teaching vocabulary. By the end of the chapter, games' design and type are comprehensively reviewed along with the teacher role when implementing personalized educational games in the classroom. This theoretical foundation prepares the ground for the practical part of this study that is delineated in the next chapter.

Chapter two:

Methodology

2.1 Introduction

This chapter uncovers the practical foundation of this research. This part of the work discusses the study's research design, and it delineates the employed methodology for investigating the efficacy of personalized-games-based-learning approach on learners' vocabulary, and its impact on learners' psychological health (emotions and mental health), and the learning environment. To start with, the chapter limns the research design along with the different instruments used for data collection, to wit: teachers' questionnaires, students' questionnaires, and an interview for educational psychologists. After that, The participants' profile is expounded, and the survey's process is depicted assiduously by discussing all the study context and procedures. The last section of this chapter displays the process of analyzing the obtained data using the aforementioned tools.

2.2 Research design

This study aims to answer the following question:

How does PGBL have impact EFL learners' vocabulary learning and learners' psychological health?

As an attempt to answer the above question, the following hypothesis was proposed:

PGBL has a positive effect on EFL learners' vocabulary learning and learners' psychological health and well being.

This research foremost objective was to investigate the role of PGBL in facilitating vocabulary learning for EFL learners'. Moreover, this study sought to understand how the PGBL approach affects learners' psychological health (emotional and mental health), motivation, and attention. As well as, this research attempts to determine PGBL's advantages in fostering a healthy entertaining learning atmosphere where learners can both gain knowledge and have fun. Furthermore, this paper compares the PGBL approach and the traditional way of teaching in improving learners' performance and achievement.

This study is a descriptive survey, "A method of research that focuses on the description of a phenomenon (what?)" (Hammoudi, 2019, p. 11) where merely a sample of the whole population is selected to represent the entire targeted community (Walker, 2020). This method can be used to provide "descriptions about educational programs, teaching methods, textbooks, and learning objectives" (Hammoudi, 2019, p. 11)

This method of research was chosen because the research is descriptive. It provides a description of the utility and the efficacy of a teaching approach (PGBL) in learning vocabulary. Besides, this type of research uncovers respondents' thoughts, opinions, and feelings in an unbiased way, which helps in gathering relevant data and emotional feedback that serves our research purpose. Furthermore, in a survey, informants can be easily reached, which makes it an effective method of gathering a significant amount of data from a subset of a population in a short time.

This research used a mixed-method approach where both quantitative and qualitative methods were used for collecting data (interview and questionnaire). This method was used to enrich the study by using quantitative surveys to collect data not gathered by qualitative means. Also, data are adequately verified and doubly examined through both quantitative and qualitative tools, which validate the obtained results ("Combine qualitative," 2018). Moreover, it helps the researcher to explore the research topic from different avenues of investigation.

2.3. Sampling

Sampling is a set of procedures through which the researchers identify the target population from which they select the sample (participants). In this research study, three samples (English teachers, EFL learners, and educational psychologists) from different populations were selected through different sampling methods and types to answer the research questions.

The samples were selected from various high schools to have a comprehensive overview of the efficacy of PGBL in vocabulary learning and in developing a healthy educational environment. Furthermore, the study aimed to gather real feedback and opinions from different EFL learners from different educational settings to estimate if PGBL's merits change when the teacher changes and the classroom ambience changes. Furthermore, since schools were closed, we had difficulties in accessing teachers and students. The number of participants from one school was so limited that we had to opt for different schools to have a considerable number of participants. Moreover, middle school learners and teachers were not responsive and difficult to reach. In that event, high school students were selected as the target sample, so they can easily understand and answer the questionnaire questions.

2.3.1. English teachers

This sample was selected through a non-probability sampling method, which involves a selective and non-random selection of participants from the target population to gather comprehensive information and data that are to the purpose. Not all English teachers (the population) were selected, but merely High school English teachers that apply educational games and content's personalization in the classroom (the selected sample). This sample was selected based on:

A purposive sampling type: only samples which were useful to the purpose of the research were selected. Merely English teachers that serve the purpose of the study and meet its requirements were selected since English teachers who do not use educational games or content's personalization would not be able to answer this research question.

The total number of English teachers who took part in this research study is 21 teachers from different high schools from various cities in Algeria:

Mostaganem: Okraf Mohamed High school, 1st November high school, Mohamed Ben Ahmed Abdel Ghani high school, and Houari Boumediene high school.

El Oued: Mahmoud Cherifi high school

Chlef: Abdellah Belharech high school

Algiers: Abdelmoumen Bouzareah

Temouchent: Blaili Djeloul high school

Tiaret: Bey Bouzid high school

This research aimed to cluster data about the efficacy of the PGBL approach in vocabulary learning in a matter of vocabulary consolidation and its impact on learners' psychology. Therefore, only teachers who have experience with the PGBL approach can meet this study's aims. Teachers, specifically, were chosen as a population because they have an overall comprehensive idea about classroom dynamics (students' emotions, behaviours, attitudes, and interactions). Therefore, English teachers (who have applied PGBL before) can provide information about all the changes (in a matter of vocabulary learning and students' attitude) in the classroom when using the PGBL approach. As well as, teachers have a

considerable awareness of learners' needs, progress, and achievements, which makes them a great source of information.

2.3.2. EFL learners

This sample was selected through a non-probability sampling method to uncover respondents' exact and real feelings and thoughts about educational games. Not all EFL learners were selected for this study. Only high school EFL learners in Mostaganem who have already learned vocabulary through educational games and learners whose English teachers were part of the participants (they answered the research questionnaire) were selected as the sample. This sample was selected based on:

A purposive sampling type: the selection of this sample emphasized on EFL learners' who have experienced a learning environment where vocabulary is learned through educational games and content is personalized. Accordingly, the selected sample can give informative data that can serve the purpose of this research.

A Convenience sampling type: the data were gathered from EFL learners who their teachers have taken part in the study. Not all the learners were responsive. Therefore, the data collection was only from the most accessible learners.

The total number of EFL learners who were selected is 22 students from different high schools in Mostaganem: Okraf Mohamed High school, 1st November high school, Mohamed Ben Ahmed Abdel Ghani high school, and Houari Boumediene high school.

This research study intends to unveil learners' attitudes, behaviours, emotions, stress levels, and anxiety levels when taking part in educational games. Also, the study seeks real feedback and opinions from learners about the efficacy of educational games in consolidating vocabulary in memory, and in fostering a positive, supportive classroom. For this purpose, EFL learners who have experience with PGBL were selected as the sample because they can provide us with detailed data that can answer the research questions. Also, high school students were chosen as the targeted sample because their English level and comprehension level was appropriate to answer the intended questions.

2.3.3 Educational psychologists

This sample was selected through a probability sampling method (random selection from the population), where any member of the population (educational psychologists) can serve the

purpose of the research. The sample was selected based on a simple random sampling type: any educational psychologist would have provided meaningful and relevant information about the subject.

Three educational psychologists were chosen as a sample. Two educational psychologists work in two different high schools in Mostaganem: Oueld Kablia Saliha high school and Zerrouki Sheikh Ben Din high school. The third educational psychologist has a doctorate in psychology, and he teaches at Abdel Hamid Ibn Badis University, in the department of sociology and psychology. Besides, he works as an educational psychologist in Mohamed Ben Ahmed Abdel Ghani high school.

Educational psychologists were selected as a sample for this study because they have significant knowledge about how learners learn and about the requirements for a healthy educational environment. Besides, educational psychologists can justify from a psychological perspective the impact of educational games and content's personalization on vocabulary learning and learners' stress level, anxiety level, motivation, attention, and emotions in an educational setting.

2.4 Data collection

This research used a binary of tools: questionnaire and interview for data collection through a sequential data gathering. Firstly, a quantitative data collection was conducted through a survey questionnaire to gather a large amount of qualitative data, and highlight the unanticipated responses. Then, a qualitative study was undertaken to gain an in-depth understanding of the highlighted point and overall research.

2.4.1 A survey questionnaire

A questionnaire is a research tool in the form of a series of questions to collect informative data from targeted informants to answer a research question. In this research study, we have used a questionnaire to gather a large amount of quantitative data and reach a significant number of participants (English teachers and EFL learners). Also, the questionnaire is adequate to investigate and cover all the different aspects of the research topic. Therefore, since teachers are the classroom's manager, the questionnaire was shared with teachers to have an in-depth, comprehensive understanding of PGBL's ramifications on students' vocabulary learning, and learners' psychological changes.

Besides, the questionnaire facilitates the process of giving answers as it provides most of the time multiple-choice-questions where participants have only to click on an answer to sound their thoughts. Therefore, the questionnaire was shared with EFL learners because they have difficulties communicating or using the English language.

2.4.1.1 Teachers' questionnaire

A formal standardized questionnaire was shared with EFL teachers to gather quantitative data to answer predefined hypotheses. The questionnaire was submitted online and shared with 21 English teachers on Facebook on the 22nd of June 2020. The questionnaire consists of different types of questions that were used for various reasons:

Open-ended questions: they were used to give a voice to participants to get a deep understanding of teachers' thoughts, opinions, and ideas about the topic.

Closed-ended questions: to get more specific answers, to collect relevant data, and to either disprove or prove a hypothesis.

Multiple-choice questions: to give respondents the choice within a guided context so that they provide answers to the purpose.

Dichotomous questions: they require answering with a Yes or a No. They aim to uncover teachers' opinions about a specific topic as they eliminate any ambivalent answers.

Scaled question: they were asked by the end of the questionnaire to scale teachers' satisfaction with the PGBL approach.

The questionnaire was in English, and it consisted of 24 questions that were divided into seven sections. The first section was about teachers' work experience (question one), and the second section investigated the importance of vocabulary learning and teaching (from question two to question five). The third examined the importance of using educational games in teaching vocabulary (from question six to question nine), while the Fourth section was about the game's personalization (from question ten to question eleven). The fifth section explored Personalized educational games' efficacy on vocabulary learning, learners' psychological health and performance (from question twelve to question eighteen), and the sixth section was about PGBL application in the classroom and disadvantages (from question nineteen to question twenty-two). Finally, the last section compared the outcomes of the

PGBL application and the traditional teaching, and this part uncovered teachers' experience with the PGBL (from question twenty-three to question twenty-four).

2.4.1.2 EFL learners' questionnaire

A formal standardized questionnaire was shared with EFL learners to gather meaningful, relevant data that serve the research's needs. The questionnaire was shared online through Facebook with 22 students on the 26th of June 2020. This questionnaire aimed to get a deep understanding of learners' thoughts and opinions toward learning vocabulary through educational games, and whether it was a positive, healthy experience in comparison to the traditional way of teaching. The questionnaire aimed to gather data from learners merely about educational games, not personalized games, since learners do not know about personalized content as teachers do. The questionnaire was shared online through Facebook to have easy access to learners from different schools.

The questionnaire was translated into Arabic so that learners can easily understand the questions. It consisted of 12 questions of various types. Seeing that learners struggle to communicate in English, most of the questions were multiple-choice questions with the "other" option to make students feel comfortable disclosing their answers. When learners do not find the right answer in the suggested answers, they can give their answer in the "other" option. Multiple-choice questions aimed to gather accurate, relevant data that are to the purpose. Open-ended questions were a few times used so that learners sound their thoughts, feelings, and opinions about educational games. Also, close-ended questions were used to get one specific, valid, and unbiased answer.

The 12 different questions are divided into four different sections. The first section investigated students' vocabulary learning (from question one to question three), while the second section inspected educational games' efficacy in learning vocabulary (from question four to question eight). The third section explored the impact of educational games on learners' anxiety, stress level, and motivation (from question nine to question eleven). Finally, the fourth section examined the difference between learning through educational games and learning through the traditional way of teaching (memorization, reciting, etc.) (question twelve).

2.4.2. Educational psychologists' interview

The interview is a research method of collecting data in the form of oral conservation in which a person (interviewer) asks a set of questions to another person (interviewee) to gather information. According to Hammoudi (2019), an interview is a "presentation of oral-verbal stimuli and reply in terms of oral verbal responses" (p. 7).

A personal standardized-structured interview was conducted with three educational psychologists. This type of interview was chosen to obtain greater in-depth data, which increases the results' validity. Since the questions were already predefined and specific, respondents' understanding of the questions will be guided to the targeted phenomena, which helps in gathering answers that are relevant and to the purpose.

The interview was conducted face-to-face to discard any misunderstanding. The interview language was adapted according to the interviewees: for some, it was translated into Arabic, and for others into French. The interview was conducted in three different places:

- High school of Oueld Kablia Saliha on the 24th of June, 2020. The respondent's answers were directly noted in a notebook. The interview lasted around one hour.

- High school of Zerrouki Sheikh Ben Din on the 24th of June 2020. The respondent's answers were directly noted in a notebook. The interview lasted around 45 minutes.

- The third interview was recorded by the phone in the respondent's house in Mostaganem on 26th June 2020. The interview lasted around 45 minutes.

The interview aimed to collect information from educational psychologists about the impacts of educational games' on learners' vocabulary learning, learners' psychology, motivation, and attention. By the end, they were asked about the importance of content's personalization.

The interview consisted of 10 questions that differ in types. Most of the questions were open-ended questions to allow respondents to voice their opinions and real thoughts about the impact of educational games and content's personalization.

The questions were divided into four sections. The first section aimed at investigating the efficacy of educational games on vocabulary learning (question one). The second section examined the impact of educational games on learners' psychology, motivation, and attention

from a psychological point of view (from question two to question six). The third section was about learners with ADHD and the impact of educational games on these learners (from question seven to question eight). Lastly, the fourth section examined the importance of the content's personalization (from question nine to question ten).

2.5 Data Analysis

This research aims to investigate PGBL's potency in facilitating vocabulary learning and promoting a supporting healthy learning environment. Moreover, this study's objective is to understand the impact of PGBL on learners' psychological health (emotional and mental health), attention, and motivation. The data were gathered through a binary of tools, namely, questionnaire and interview. The data collected were both qualitatively and quantitatively analyzed:

2.5.1 Teachers' questionnaire

The quantitative and qualitative data were analyzed based on a thematic and descriptive method.

The following bar graph (figure 2.1) demonstrates the participants' work experience. Most of the participants (81.0%) had a teaching experience between 5 to10 years. However, 4.8% of the respondents had a teaching experience that ranges between 3-5 years, and only 14.3% of the participants had a teaching experience between 1 to 3 years. The results indicate that most of the participants have extensive experience in teaching the English language, which would add validity and weight to our study.

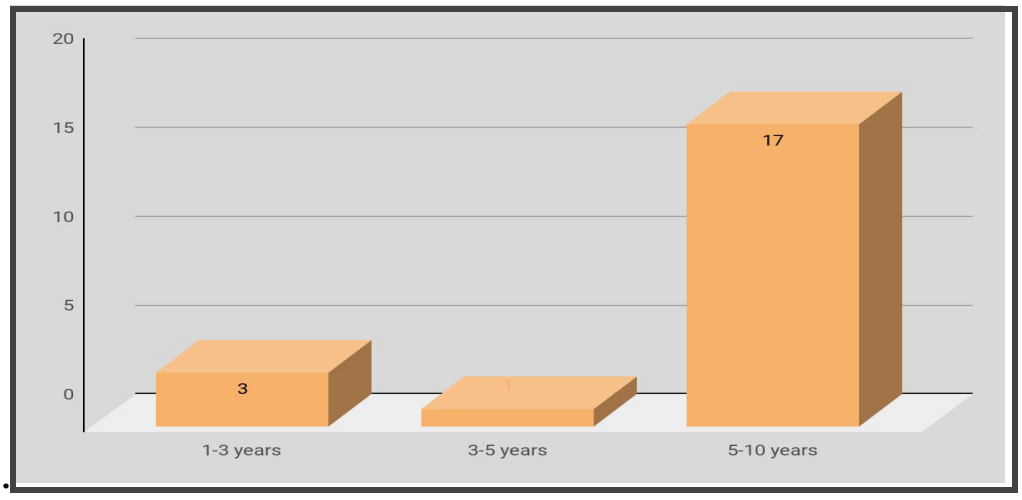

Figure 2.1: Participants' work experience

In the second question, the teachers were asked about their students' fluency in the English language. Only 5 teachers (23.8%) from 21 teachers answered "Yes" and claimed that their students are fluent. However, 16 teachers (76.20%) stated that their students are not competent in English. The results show that the level of English language in high school EFL classes is notably low, which demands a practical teaching approach that facilitates English language learning.

To explore the fundamental reasons behind students' incompetence in using The English language fluently, the third question was addressed. Most teachers opined that the lack of practice in the classroom and the lack of students' vocabulary caused this weakness. Also, some teachers stated that students' lack of interest and motivation are the main reasons. In contrast, other teachers mentioned that students' inability to communicate in the English language is mainly due to the use of the traditional methods that are so boring. The results demonstrate that English language fluency requires a rich vocabulary and a fun learning approach that motivate learners, make them interested in learning, and sparkle their curiosity about the English language.

The fourth question aimed to uncover teachers' opinions about the necessity of having enough vocabulary to use the English language fluently. As Figure 2.2 (bar graph) demonstrates, nearly all teachers (85.7%) assumed that vocabulary is an essential element to communicate in the English language evenly. In comparison, only 3 teachers (14.2%) said that having enough vocabulary is not necessary to be fluent in the English language. The answers clarify that the majority of teachers regard vocabulary as a potent knowledge so that learners can sound their ideas in the English language.

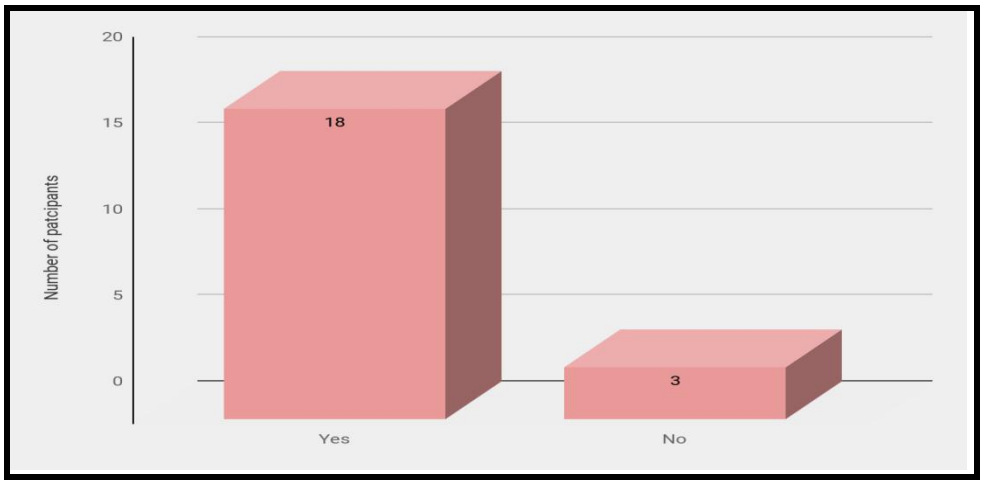

Figure 2.2: The importance of vocabulary to reach fluency in the English language

Concerning vocabulary teaching, the fifth question inspected the most used methods for teaching vocabulary. The following bar graph (figure 2.3) shows that the same percentage of 14.3% of teachers opted for translation and synonyms. 3 teachers claimed that they use the translation method, and the other 3 teachers claimed that they use synonyms more often to teach vocabulary. On the other hand, only one teacher declared that he uses memorization, and another teacher said that he uses definitions. However, 61.9% of all teachers (13) reported that they use games frequently in the classroom to teach vocabulary, which accentuates games' efficacy in teaching vocabulary to their learners.

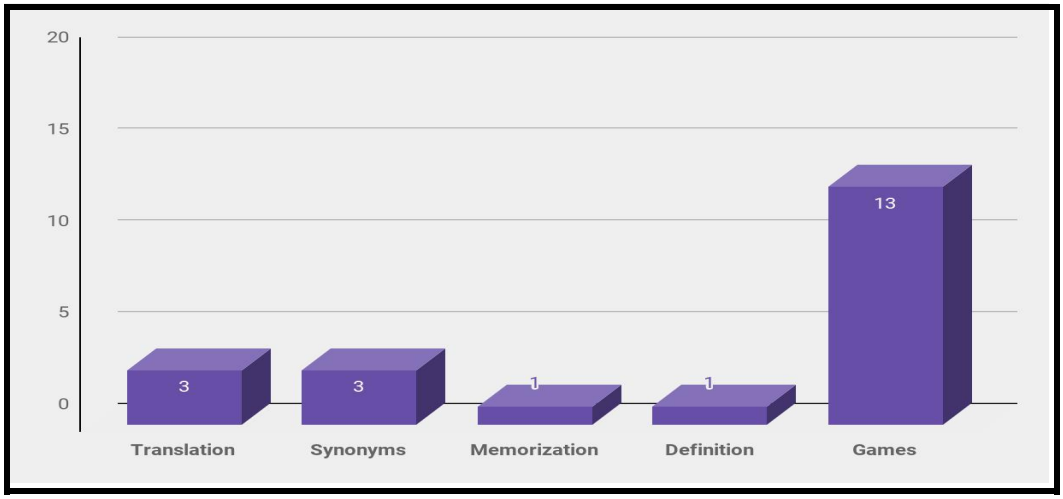

Figure 2.3: The most common methods used in teaching vocabulary

Question six targeted teachers' authentic opinions and thoughts about games-based-learning approach effectiveness in teaching vocabulary. 95.2% of teachers declared that games are an effective approach to instruct vocabulary. However, merely one teacher claimed that games are not effective to teach vocabulary. The teachers who acknowledged games' efficacy stated that games "help a lot in learning new vocabulary" as it encourages learners to be involved in the learning process. It also changes the learning atmosphere into a new, better one". Other teachers opined that games are a "motivating technique" and a beneficial way to remember newly learned words as" it keeps the learners interested", and it breaks the routine. The latter explains that most teachers spotted change when applying games to teach vocabulary as it eased the learners' vocabulary learning process and provided them with a joyful motivating learning environment.

Question seven probed how many times teachers apply games in the classroom. The bar graph (figure 2.4) shows that 28.6% of the teachers used games daily, and 52.4% of the teachers employed games regularly (often). However, 23.8% of the teachers claimed that they

rarely utilized games, and no teacher chose the "never" option. The latter indicates that teachers saw a great benefit from applying games, and learners enjoyed the games' atmosphere.

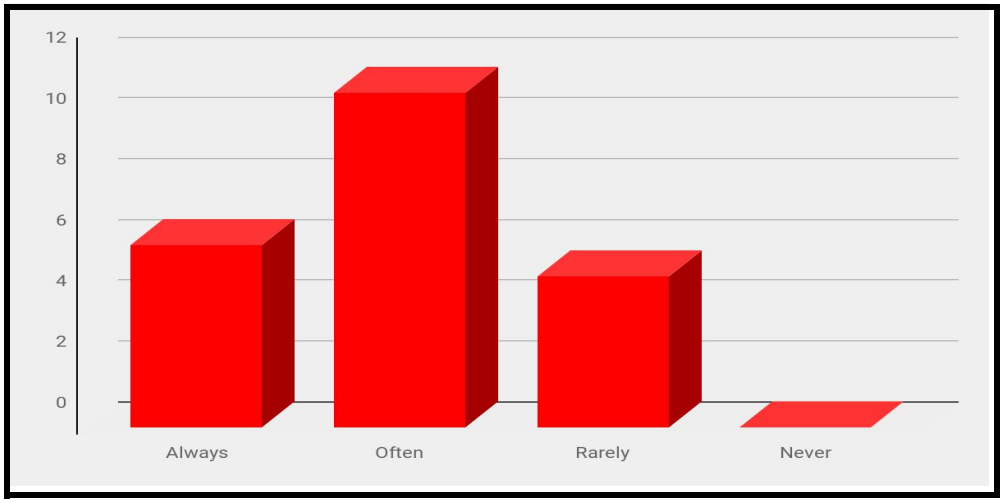

Figure 2.4: The frequency of using games in the classroom

Question eight investigated the kind of games teachers often use to teach vocabulary. The most commonly used games are games of checkers, crosswords, pyramids words, and run to the board. One teacher explained that she uses games based on active learning strategies where learners stand up and move, such as gallery walk, Pictionary, plays, and game boards. Another teacher claimed that he uses three games out of one game. He expounded that by the end of a unit or a particular vocabulary lesson, he divides the whiteboard into two parts, and the students into two groups. When he says "go," students have to run to the whiteboard, and each student has to write one vocabulary until the teacher says, "stop." After that, all together, they count the vocabulary written on the board and the group who has written more words wins.

The second game is "check the spelling" where students have to correct the spelling mistakes from the written words in the previous game. In the third game, " put in the sentence," students have to put the written vocabulary in a sentence. The answers gathered shows that most of the teachers use different games to teach vocabulary. Teachers use both games based on movement, and thinking games, which allows students to learn from different modalities, and reinforce the vocabulary learned.

To investigate games' competence in consolidating vocabulary in learners' memory, question nine aimed to reveal teachers' beliefs about the topic out of their experience.

90.50% of the teachers believed that games have a significant role in making learners recall newly learned words. 9.50% of the teachers assume that games are "somehow" efficient in strengthening vocabulary in learners' memory. Only one teacher answered, "No." The results imply that the majority of teachers have noticed that games have the ability to reinforce learners' memory and promote long retention of vocabulary.

Question ten aimed to reveal the number of teachers who have used personalized games before and how the different teachers personalized content. As the figure 2.5 (bar graph) exhibits, 19% of teachers did not personalize content before. However, 81% of teachers claimed that they personalize games. The same teachers declared that they change the lesson's frame according to their students' needs, learning preferences, way of understanding, and level. Some other teachers stated that they keep the same lesson theme, but they change games' activities, objectives, and examples by bringing videos and pictures that serve the topic. One more teacher summarized the whole process of personalization in a few words: The "how" is dependable on the "who". Most answers focused on tailoring the lesson frame to meet learners' differences, which recognized the need to provide personalized assistance to each learner

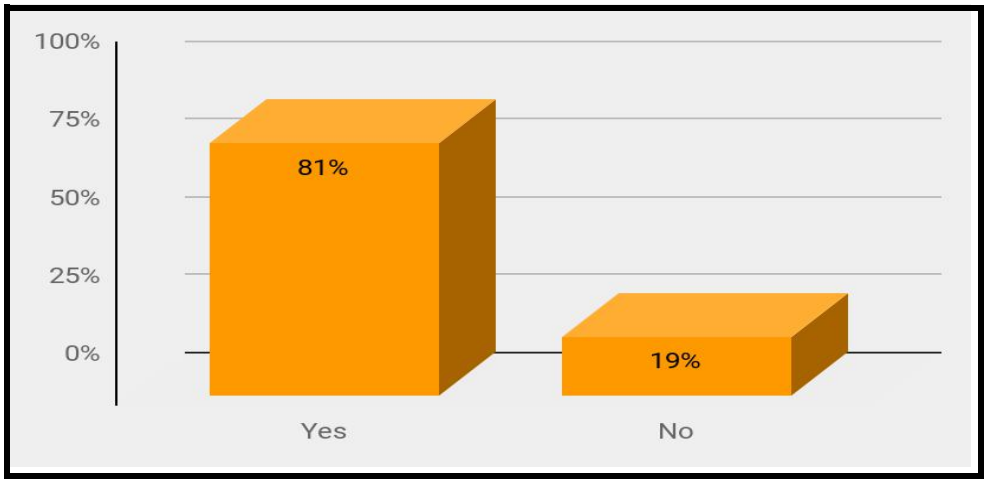

Figure 2.5. Subjects' application of the personalized-games-based-learning approach

Question eleven focuses on the games' personalization potency in meeting students' needs. All teachers who have personalized games before believed that games' personalization is an effective method to satisfy learners' needs, fulfil the lesson's objectives, and grab students' attention. Some other teachers asserted that games' personalization helps learners' further their vocabulary repertoire through facilitating learning and memorization. The

answers show that the majority of teachers acknowledge games' personalization qualifications in the learning environment.

To determine the impact of personalized games on learners' vocabulary learning from teachers' observations, question twelve was addressed. 23.8% of teachers claimed that the personalization of games somehow helps learners learn vocabulary. However, one participant stated that vocabulary learning was not effective when applying personalized games. On the flip side, 71.4% of teachers agreed that games' personalization has a role in easing the vocabulary learning process. These teachers opined that personalized games promote easy memorization, "better understanding" and increase learners' motivation and interaction. The same teachers stated that newly learned vocabulary was "unforgettable," and learners tend to use words correctly in different contexts. This means that learners' assimilation of vocabulary input through their preferable learning style was beneficial.

One teacher said that learners were able to "retain the learned vocabulary for a longer period and retrieve more words." Another teacher mentioned that he had not applied personalized games too often in the classroom, so he could not notice the difference. However, another teacher expressed that personalized games invited "intrinsic and shy students'" to participate, and promoted collaborative learning, which implies that learners enjoyed learning through games that cater to their various needs.

Question thirteen aimed to display teachers' observations about learners' psychological or behavioural changes when implementing personalized games. Table 2.1 shows that nearly all teachers (95.20%) noticed psychological and behavioural developments in learners after applying personalized games. This indicates that most learners have reacted to personalized games, which refers to their engagement in the learning process. However, only one participant claimed that he did not notice any change, which implies that not all learners react to personalized games.

Table 2.1 Teachers' observations about learners' behavioural changes after using personalized games

Answers	Number of participants	Percentage
Yes	20	95.20%
No	1	24

Question fourteen probes the impact of personalized games on learners' behaviours, emotions, and motivation. Teachers affirmed that learners were more motivated, excited, and more interested in learning. Other teachers indicated that learners were "more involved emotionally": they were feeling "happy" and "more confident." The latter implies that learners have enjoyed learning through games, and they become more attentive and interested. One teacher avowed: "The noisy pupils were motivated and busy with the games and their groups," which implies that disruptive students make noise out of boredom, lack of interest, and to seek attention. Therefore, when playing games, they feel useful and cared for, so they are more inclined to learn. Another teacher professed that personalized games "open the appetite of searching": students were eager to learn, and to discover which game is the next.

Question fifteen aimed to determine students' attitudes when taking part in personalized games in the classroom. Almost all teachers indicated that learners had a positive attitude, and they like the games. Teachers added that learners were happy, enthusiastic, and motivated. Learners were excited to play and ready to learn, which indicates that games evoked positive emotions within learners as one teacher commented: "Surprisingly, they appreciated that and felt the usefulness of learning English." Another teacher claimed that his students somehow accepted the games, which implies that the way games' are employed makes a difference in students' learning and amusement.

Question sixteen uncovered teachers' evaluations of students' performance in vocabulary tests after learning through personalized games. Table 2.2 shows that almost the majority of teachers (85.7%) declared that learners' performance in the test improved after learning vocabulary through personalized games. However, 14.3% of the teachers announced that their students did not perform better in the test after learning through personalized games. The previous results imply that the majority of students successfully grasped knowledge through educational games. Nevertheless, not all learners assimilate input through games, as some teachers have not noticed any improvement.

Table 2.2 Teachers' evaluation of students' performance in the test after learning vocabulary through personalized games

Answers	Number of participants	Percentage
Yes, they performed better	18	85.70%
No, they did not perform better	3	14.30%

Each teacher commented on his learners' performance in tests differently. Question seventeen sought to explain the noticed changes and developments in learners' performance after learning through personalized games. Most teachers noticed an improvement in writing tasks, and a better understanding of reading materials as learners started to use the learned vocabulary from games in writing and in comprehending texts. One teacher added that his learners "understood the text and the keywords inside the passage." Teachers' comments entail that most students have grasped the vocabulary learned through games adequately, which reinforced their word retrieval.

Question eighteen attempted to investigate the capacity of personalized games in engaging all the diverse students in the learning process. The following bar graph (figure 2.6) evinces teachers' feedback about personalized' games competency in engaging all the different learners. 66.7% of teachers declared that personalized games engaged all learners despite their differences. However, 33.3% of teachers, which is almost half of the totality, claimed that personalized games did not engage all the different learners. This reveals that not all learners are interested in playing games, and personalized games did not fulfil all learners' needs.

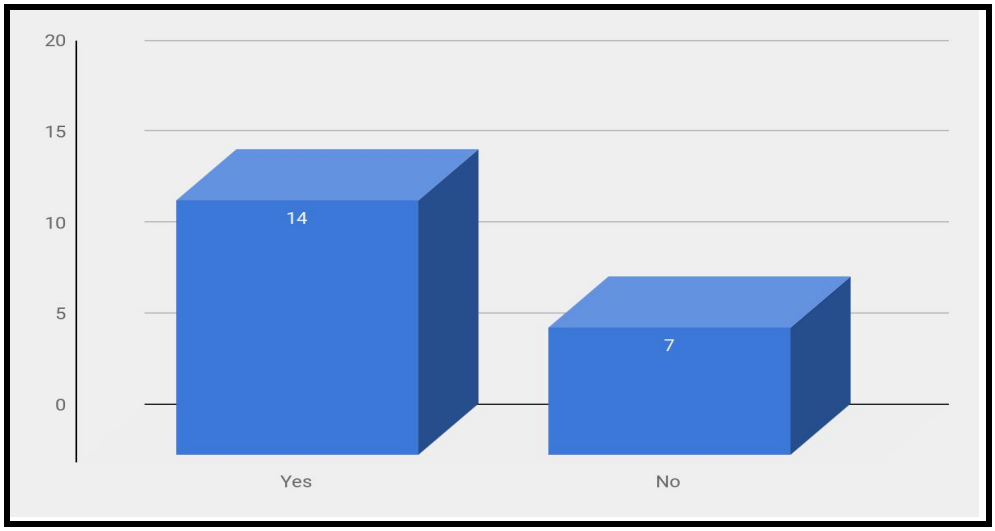

Figure 2.6. Teachers' feedback about learners' engagement in personalized games

Question nineteen was addressed to determine the strategies and techniques that make the application of personalized games easy. 61.90% of participants said that personalized games are easy to apply. However, 42.90% of subjects claimed that the application of personalized games was difficult. The difference between the two statistics is not significant, which implies that personalized games require teachers with mastery and competence. This indicates that the participants who voted with "yes" are proficient and use different

techniques to apply games effectively. These teachers have mentioned different techniques and strategies they have used:

-The use of group-work with a leader so that the teacher can manage the whole classroom easily.

-Involve most of the learners in the teaching process. For example, learners can explain the game's instructions to their other peers, or they can bring educational games relevant to the lesson.

-Link the content to students' real life.

-The use of group correction, Jigsaw games, and ICT.

-Time management and good planning.

Question twenty attempted to estimate the different difficulties teachers faced when applying personalized games that may prevent games' utility. Teachers' answers were approximately repetitive. The most common challenges teachers met are:

-Mixed-ability classroom.

- Overcrowded classroom.

-Students' understanding of the game's rules.

-Students get over-excited and overactive.

-The classroom becomes noisy because all students are interested and involved, and they all want to play.

-The lack of time for preparation.

-The lack of materials.

The different challenges teachers faced when implementing games based learning were within the same compass of classroom management. This shows that teachers should have a set of skills and techniques to manage the classroom and apply games effectively.

Question twenty-one discussed the hypothesis that claims that "games are a waste of time." All participants disagreed with the statement and agreed that the majority of learners appreciated games. One teacher stated that if the teacher manages the teaching time effectively, "It could be even time gaining." This shows that teachers' proficiency in managing the games can either increase or hamper games' efficacy. Another teacher affirmed

that "nowadays generations are more into online games so psychologically speaking this will be more attractive." However, they added that it depends on the kind of learners because some learners do not take learning seriously when games are applied.

Question twenty-two aimed to uncover the PGBL approach's disadvantages. Teachers give different opinions. One teacher declared that "their advantages are super to the point that we can not notice any disadvantages." Another teacher added, "No disadvantages if games are well selected." However, other teachers stated clearly PGBL approach disadvantages:

-Noise: learners become overexcited and overactive.

-Time-consuming as it takes time to plan for it and to apply it.

-Loss of students' control: when they all want to participate.

-Not easy to implement.

-Some students' take the lesson less seriously.

-Physical strain: teachers have to stand long hours.

-Distract learners' attention: some learners focus on the games and forget about the lesson.

These answers indicate that the PGBL approach disadvantages are not very severe as it merely requires careful management and planning.

Question twenty-three aimed to uncover all the changes and improvements noticed by teachers when applying personalized games in comparison with the traditional way of teaching. Most teachers (90.50%) had positive comments concerning the developments promoted by the PGBL approach in the classroom. Teachers claimed that learners recalled vocabulary more easily than when using translation and memorization methods. The same teachers stated that learners become more motivated and autonomous. It is clear that games activities encourage learners to make efforts to win the games, and simultaneously to use the language and learn. One teacher declared that his learners were so excited to start the lesson, as they were accustomed to "creativity and innovation."

The collected answers entail that personalized games broke the boring routine, which engaged learners' in a play environment that develops their vocabulary learning and creativity. One other teacher mentioned an important point. He claimed that he noticed improvement more in poor learners as they felt "more comfortable and less separated"

because learners are more willing to take part in games activities rather than traditional activities.

Another teacher surmised that games involved "all the basic language skills, i.e., listening, speaking, reading, writing, and many skills are often involved in the same game". A different teacher declared that he enjoys teaching using games because more lesson's "objectives were achieved with fewer efforts." This means that personalized games increase learning opportunities and encourage learning in comparison to the traditional way of teaching. However, two participants (9.50%) did not notice any improvements in learners' performance when applying personalized games. This implies that not all learners can grasp knowledge through games, and not all teachers can apply games effectively to achieve the desired results.

The last question attempted to demonstrate teachers' satisfaction with the PGBL approach experience. As the following bar graph (figure 2.7) shows that 10 teachers out of 21 were satisfied with the experience as on a scale of 1-10, they give it an 8. Also, 2 teachers mainly give their experience 10 out of 10. However, merely two teachers who rated their experience under 5, which implies that most of the teachers enjoyed applying personalized games as games were fruitful and effective.

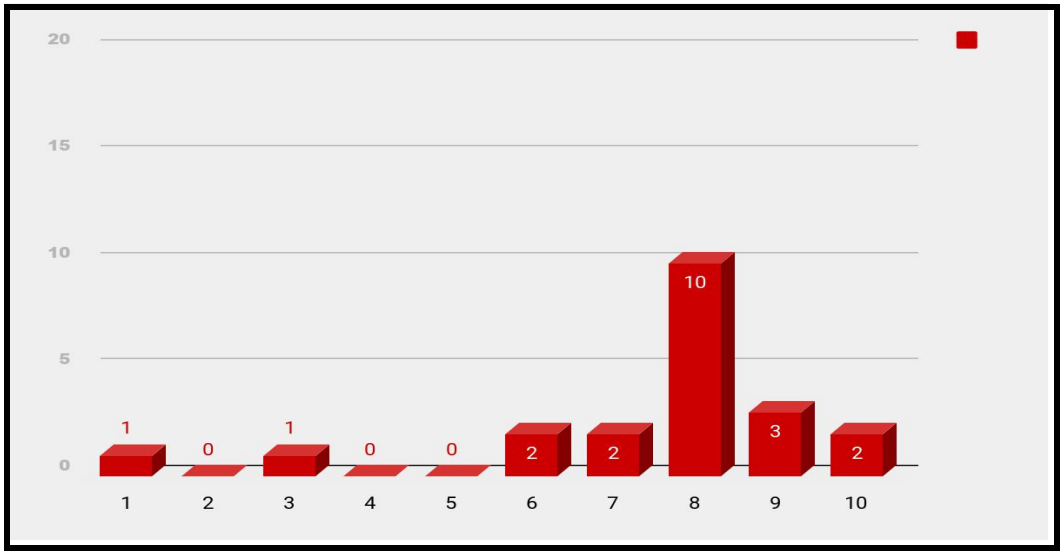

Figure 2.7. A scale that demonstrates teachers' satisfaction with the personalized-games-learning approach

2.5.2 Analysis of students' questionnaire

The data were analyzed based on a thematic descriptive analysis.

Question one aimed to highlight the different challenges students faced when learning English vocabulary. As table 2.3 above shows, 36.40% of students stated that they have difficulty in recalling the learned vocabulary, 23% of students claimed that they have difficulties in learning vocabulary because one word has different meanings and synonyms. 13.60% of students maintained that the number of vocabulary they have to learn to meet the lesson's objectives or to pass a test is high, which confuses their recalling of all the words. The other 18% of students declared that the lack of concrete examples and items that describe the vocabulary learned prevented their understanding and memorization.

The results demonstrate that vocabulary learning requires an effective method that promotes memorization and provides students with concrete illustrations so that they will not confuse synonyms and learn how to use vocabulary in the correct context. In the "other" option, one student mentioned that when learning vocabulary, it is "hard" to understand words as he feels confused, and another student stated that he does not have any problem.

Table 2.3 Students' challenges when learning vocabulary

Answers	Number of participants	Percentage
Difficulty in memorization	8	36.40%
There are too many synonyms	5	23%
The number of vocabulary to learn	3	13.60%
The lack of concrete examples	4	18%

The second question aimed to demonstrate the different techniques students use to learn vocabulary. As table 2.4 shows, the majority of students (45.50%) use repetition to memorize vocabulary. 13.60% of students prefer to use dictionaries when learning vocabulary to look for meaning and synonyms. Another 13.60% of the students use notebooks to jot words with their meanings. Only one student claimed that he uses pictures to draw the words he wants to learn, and 18% of students merely use games to learn vocabulary. In the "other" option, one student stated that he uses both dictionaries and games to learn vocabulary. The results indicate that most students are still using the traditional method to learn vocabulary, and only a few students use games.

Table 2.4 The different techniques students use to learn vocabulary

Answers	Number of participants	Percentage
Repetition until memorization	10	45.50%
The use of dictionaries	3	13.60%
Draw a picture	1	4.50%
The use of a notebook of words	3	13.60%
Vocabulary games	4	18.20%

To determine the preferable methods for students to learn vocabulary, question three was addressed. As mentioned in figure 2.8 (bar graph), the majority of students (38.80%) preferred the use of translation to learn vocabulary. The minority of the students (13.60%) favoured definitions, while 22.70% of the participants preferred the use of games, and another 22.70% of students used synonyms to learn vocabulary. Two students have not opted for any of the below suggested answers in table 9. but they have announced their answers in the "other" option. One student mentioned that he prefers to use translation, definition, and synonyms. The second student maintained that he likes to learn vocabulary from watching movies and series. The results demonstrate that nearly most students prefer to use translation to learn vocabulary, which is sometimes misleading and inaccurate, and it needs to change.

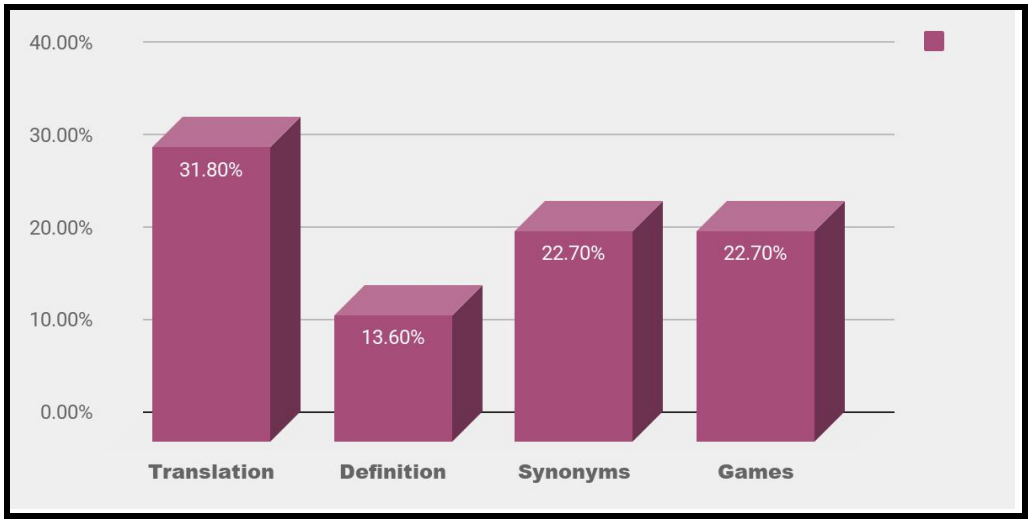

Figure 2.8. The preferable method for learners to learn vocabulary

Question four aimed to estimate the percentage of students that have already learned vocabulary through educational games. According to the below bar graph (figure 2.9), 90.9% of students (20) have learned vocabulary through educational games, while 9.1% of students (2) did not use educational games to learn vocabulary before. The results show that most

participants have experience with educational games, which would give more validity to our data.

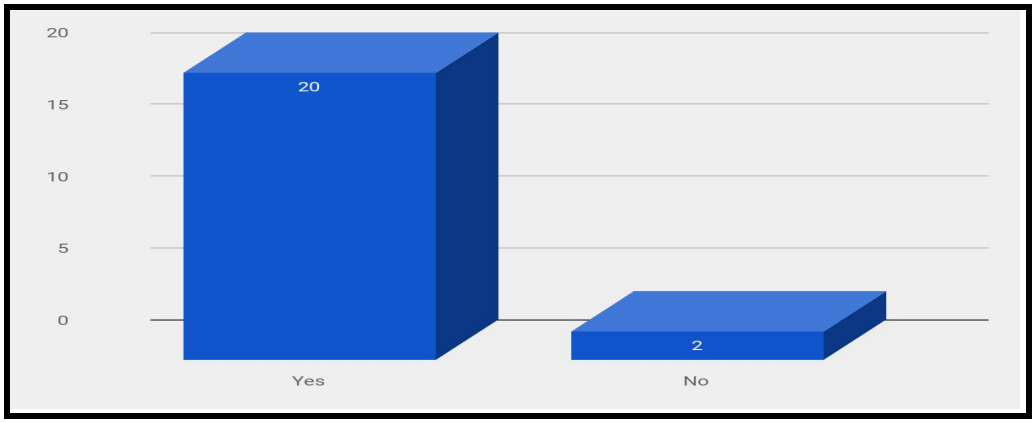

Figure 2.9. Percentage of students who have learned vocabulary through educational games

Question five aimed to demonstrate students' opinions and thoughts about educational games. All students had positive feedback and comments concerning educational games. Most students stated that educational games are a "good" method of learning that facilitates understanding as some students commented, "I learned a lot of vocabulary," "it helped a lot," another said, "it increases your motivation and creativity." This shows that students appreciated learning through games as it has facilitated the learning process. One student mentions that some games make things easier to learn, but other games are very boring. The latter implies that not all kinds of games are fun to play, and when students feel bored, they lose interest.

Question six sought to reveal the quality of students' experience with educational games. The below table 2.5 indicates that all of the 20 students who answered with "yes" in the previous question stated that they had a good experience, and they learned a lot, while no students from them claimed that he had a bad experience. The results indicate that students enjoyed learning through educational games as they had learned a lot, and they had fun at the same time.

Table 2.5 Students' experience with educational games

Answers	Number of participants	Percentage
Good, I learned a lot	20	100.00%
Bad, it was a waste of time	0	0

To investigate educational games' effectiveness in strengthening students' vocabulary retention is essential to answer this research question. Thus, Question seven aimed to uncover students' opinions. 77.30% of the students declared that they had retained vocabulary for a more extended period. However, 22.70% of the students claimed that they could not recall vocabulary for a long duration. This demonstrates that not all students assimilate and process input in the same way through educational games. When learning through educational games the majority of learners can memorize vocabulary for a longer time, but some other learners' vocabulary is not stored for a long duration.

Question eight aimed to determine whether learners take games seriously or not. The bar graph (figure 2.10) demonstrates that 9.10% of the students learned through educational games, but they have not had fun, whereas 4.5% of the students felt that they are just having fun without learning anything. This indicates that not all learners enjoy playing games, and some learners do not take games seriously as they regard it as a means for fun merely. However, 86.40% of the students claimed that they learned something while having fun, which means that the majority of students take games seriously and consider it as a learning tool, but that does not exclude the minority who want nothing but to have fun.

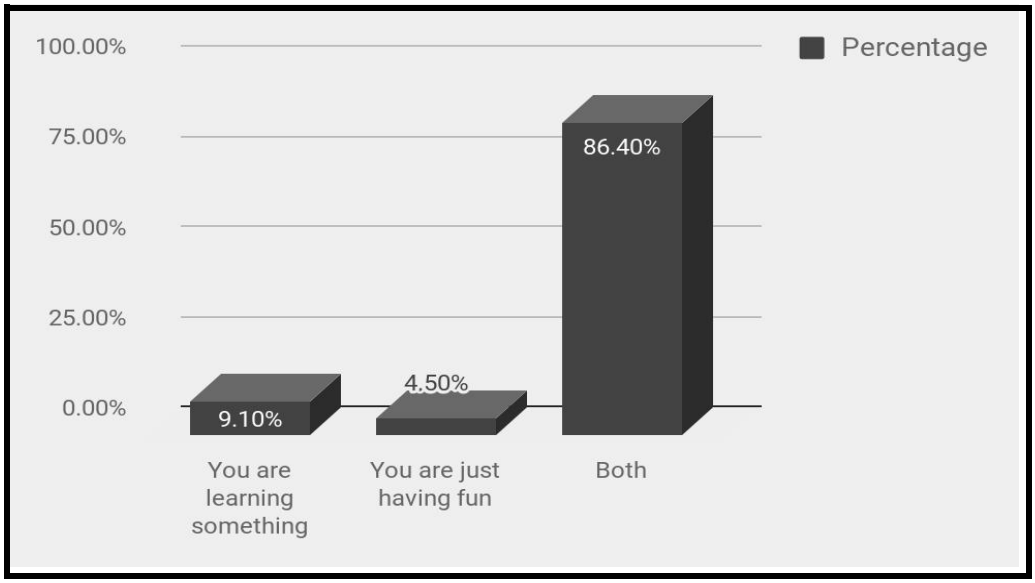

Figure 2.10. Students' perceptions of educational games

Regarding educational games' impacts on students' emotions and motivation, question nine aimed to reveal students' perceptions about the matter. As the bar graph (figure 2.10) shows, 81.80% of the students declared that they noticed change regarding their emotions and motivation, while 27.30% of the students did not notice any change in their motivation

or anxiety. This implies that educational games play a role in motivating students and in appeasing their stress and anxiety. However, educational games do not impact all the different students similarly, besides not all students have anxiety when learning.

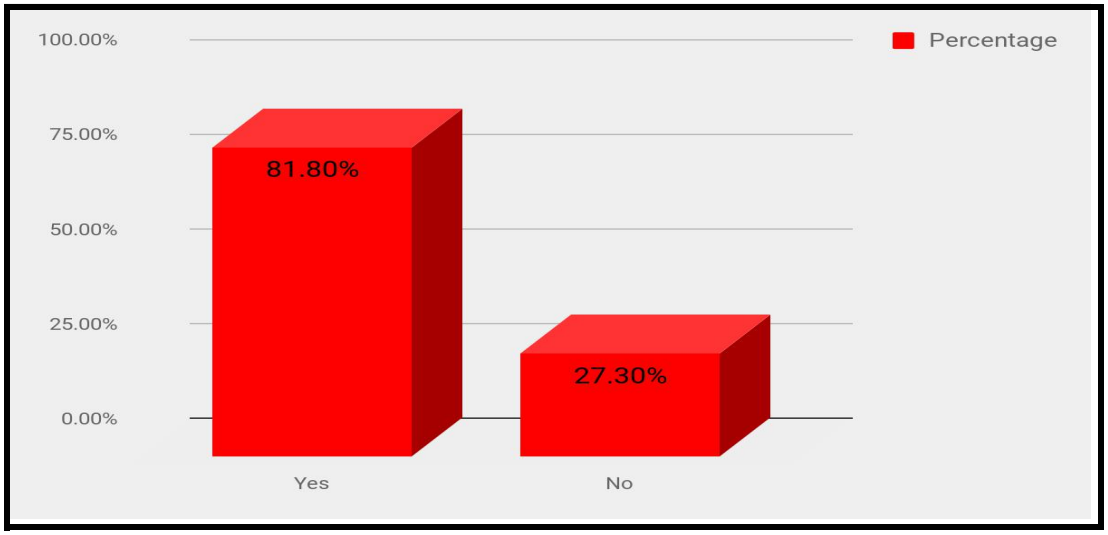

Figure 2.11. Educational games' impact on students' motivation and anxiety

To understand how educational games generated emotional and motivation changes, question ten was addressed. Most of the students stated that educational games affect them positively as it motivates them "to learn more," and they have become more interested but never bored. One student declared that educational games helped him when he felt upset as he had to focus on the game to solve it and forget about the thing that unnerved him. This means that games eliminate distractions, which increases the student's attention and directs it to the lesson. One student commented, "yes, games lessened my anxiety a lot ." The same student added that she used to cry when being asked to answer a question in English, but games helped her a lot to feel comfortable and take the initiative to participate. This shows how games reduce students' inhibition and encourage them to get engaged in the classroom's activities.

Question eleven sought to uncover students' real feelings in an education setting where games are used as a teaching method. According to table 11 below, 52.40% of the students felt satisfied, and 33.30% of the students were feeling comfortable when playing games. This expresses that the majority of the students were enjoying learning with fewer worries about their insecurities. One student maintained that he felt confused when playing educational games, which reveals that the teacher did not explain the game's rules, objectives, and the way of playing. Hence, the student felt lost. However, no student claimed that he felt

uncomfortable or unsatisfied. Two students who have not chosen any of the below suggested answers in table 11, but they commented inside the "other" option. One student stated that he felt that he wanted to play more games, and the other student declared that he was enjoying the games and he felt like learning something new.

Table 2.6 Students' feelings when playing educational games

Answers	Number of participants	Percentage
Comfortable	7	33.30%
Satisfied	11	52.40%
Confused	1	4.80%
Uncomfortable	0	0%
Unsatisfied	0	0%

The last question attempted to compare the traditional way of teaching and teaching through educational games from learners' perspectives. Table 12 below demonstrates that 40% of the students claimed that educational games are more enjoyable, and 15% of the students declared that they learned more vocabulary. In contrast, no student announced that he/she learned less vocabulary. This indicates that the majority of learners enjoyed learning vocabulary through educational games, which, according to the results, tends to be effective in reinforcing vocabulary memorization. 40% of the students proclaimed that they were more satisfied with the result. In contrast, no students reported that they were less satisfied with the results, which shows that most students noticed an improvement in their learning after learning through educational games.

Table 2.7 Students' feelings when learning through educational games in comparison with the traditional way of learning

Answers	Number of participants	Percentage
More enjoyable	8	40%
Less enjoyable	1	5%
I learned more vocabulary	3	15%
I learned less vocabulary	0	0%
I was more satisfied with the results	8	40%
I was less satisfied with the results	0	0%

2.5.3 Analysis of the educational psychologist's interview

The data were analyzed through a content analysis method as I analyzed data from text and media.

The first question investigated the effects of educational games on students' learning and vocabulary learning from a psychological perspective. All participants agreed that educational games impact language learning and vocabulary learning positively. One psychologist explained that games link between the word and the image, so the learner will fully know the word and adapt to it, which leads to complete assimilation and grasp of vocabulary.

Another respondent declared that games add pedagogical guidance as it provides better illustration and visualization of the different notions in a foreign language, which facilitates stimulation, assimilation, and comprehension. The participant added that since games ease understanding, it undoubtedly strengthens the memory of words. This indicates that educational games increase words' understanding and, therefore, memorization. One interesting point that was mentioned by one of the participants is that games' efficacy dissipates if the teacher does not provide guidance, which highlights the teacher's role in the educational setting when games are implemented.

Question two inspected if educational games affect students' psychology. Respondents' answers were approximately within the same ambit. All psychologists admitted that games eliminate boredom, which appeases anxiety and stress, and evokes positive emotions. This implies that games assist learners' mental health and affect them positively.

To explain the different impacts of educational games on learners' psychology, question three was addressed. All educational psychologists agreed that educational games mollify students' stress and provoke positive emotions. One participant expounded that play is a process of spending energy that regulates the stress level and consumes negative energy. The respondent put forward that within games, there are freedom, play, and pleasure, which increase positive emotions and motivation. The other participant emphasized more on the teacher's competence than on games' efficacy as he declared that games could not work spontaneously without the guidance of the teachers because students' emotions when learning reflect how the student is treated within the classroom confines. The latter indicates that students' well being depends to a great degree on the teacher's way of approaching them.

Answers to question four illustrate how educational games lesson negative emotions and generate positive behaviours. One participant declared that in psychology, games are used in behavioural psychotherapy to treat unhealthy behaviours, which implies that games are scientifically known for their benefit in treating behaviour. Another respondent expounded that students with bad behaviour are students who seek interest and feel rejected. However, games provide these students with the opportunity to communicate and participate in solving an issue so these students will be involved in the learning process, and they will feel useful, respected, and well regarded. Eventually, students will develop a positive attitude. This participant concluded his answer by saying that games are an effective medium to mitigate students' stress, fear, and all negative emotions. This shows that games are useful in foreign language classes, as the level of fear and inhibition is high.

To understand the impact of games on students' motivation, question five was addressed. All participants agreed that games boost students' motivation. One participant explained that educational games are a new learning method that differs in many aspects from the traditional way of teaching, which sparks learners' curiosity and encourages learners to learn more using games. Another participant declared that learning through games improves learners' assimilation so, eventually, they will have better results, he added, this improvement in results will automatically increase learners' motivation to make more efforts. This shows that students' performance in tests after learning through games will become a motive to make more efforts and get more advanced results.

Since it was claimed that educational games affect attention and concentration, question six sought to investigate whether games increase learners' attention or not. All participants agreed that educational games do enhance learners' attention. One participant maintained that learners loathe routine and stagnation, but games break the routine and bring variation and action to the learning process, which helps learners stay focused and attentive. This demonstrates that games' variation in content, as activities and colours entice learners' attention and maintains their interest. Another respondent claimed that games create interactivity between the student and the game, between the student and the teacher, and between the student and the other classmates, which maintains the student's attention and concentration. This shows that educational games link all the elements of the learning process, which engages the different students in this process.

Question seven was addressed to estimate the likelihood of having students with ADHD since our research takes an interest in each learner. All participants agreed on the possibility of having students with ADHD approximately in each classroom. One respondent claimed that there are 3% of students with ADHD in each school, and another participant declared that according to Word's Wealth Health organization, there are 10-15% of children with ADHD in each society. This indicates that it is inevitable to have students with ADHD in any learning environment. The participant added that ADHD students are the one who makes noise, disruptive, and talkative. The participant explained that these learners have a deficiency in Dopamine neurotransmitters.

Since it is inevitable to have learners with ADHD in each classroom, question eight aimed to explore how games can help these learners and whether games impact them positively. All participants approved that educational games can help students with ADHD learn better. One participant explained that games consume and absorb all the extra energy that ADHD students have, which will help them to stay attentive and focus. Another participant declared that educational games have a positive impact on ADHD learners as it involved them within the learning process. The respondent continued to explain that games' positive effects on learners with ADHD can not happen, unless with the guidance of the teacher and with practical assistance. This reveals that educational games' efficacy is substantially more contingent on the teacher's qualifications and mastery.

Question nine investigated the importance of lessons' personalization from a psychological perspective. All psychologists agreed that the personalization of content is significant in improving learning and teaching as one of the participants revealed that content's personalization works 100% in promoting education. This explicates that personalized learning is of great efficacy in improving learning. Another respondent declared that in psychology, there are individual differences, and the teacher should use diagnostic tests to identify the differences in his classroom. The same participants added that the teacher should care and give more attention to poor learners as they need more attention.

The last question was addressed to inspect how personalized content impacts learning. One participant expounded that students differ in the way they process input as some students are auditory, others are visual, and some are musical, etc. She added that personalized content has great results in improving students' learning as it caters to each learner's difference. Another respondent declared that personalization provides the educational setting with

different means of learning that can respond to different learners' needs. This clarifies that the personalization of games provides diverse learners with various learning opportunities. The same participants put forward to explain that every little attention the teacher gives to students has ample profit. Therefore, the personalization of content has adequate benefits in improving students' learning.

2.6 Conclusion

This chapter uncovered the methodology followed in conducting this research. It starts with the research design that talks about the type of research undertaken and the mixed-method approach used. Following that, a detailed description of the sampling method and the different participants who contributed to this research were provided. Then forth, a comprehensive delineation of the instruments used in collecting data is given. At long last, the different data collected were synthesized and analyzed. This chapter is an introduction to the following chapter that will advertise the summary findings and their interpretation in conjunction with the limitations and the recommendations.

Chapter three:

Interpretation of Results & Recommendations

3.1 Introduction

This research aims to inspect the repercussions of applying the personalized-games-based-learning approach to teach vocabulary to EFL learners, and its influence on learners' psychological health (emotional and mental health), motivation, and attention. This chapter coalesces the summary of the findings that form the basis of this research and their interpretation. Added to that, the different limitations are acknowledged and the recommendations for future research are generated.

3.2. The summary of the results

This part of the chapter epitomizes the findings advertised and analyzed in chapter two. These findings were assembled through two discrete data collection instruments, videlicet questionnaires, and interviews.

3.2.1 Questionnaire Results

Questionnaires were shared with two different participants: English teachers, and EFL learners.

3.2.1.1 Teachers' questionnaires

The eminence of vocabulary learning in English language proficiency

Teachers enunciated that the paucity in vocabulary size and language practice deficit are the major reasons for EFL learners' English language ineptness. Accordingly, The majority of teachers agreed that having enough vocabulary is mandatory to reach fluency in the English language.

The efficiency of educational games in strengthening vocabulary recall

The majority of teachers use educational games to teach vocabulary regularly. Teachers declared that they use different games in one lesson to target different learners' needs. These games can be thinking games or games based on movement. For example, gallery walks, Pictionary, plays, game boards, games of checkers, crosswords, pyramid words, and run to the board.

The majority of participants agreed that games are an effective method to remember new words' meanings. Learners demonstrated learning through the correct application of words in written and reading tasks.

The prominence of personalized games in learning

The majority of teachers agreed that personalized games are an effective method to keep students' attention and to hasten their vocabulary learning as it facilitates the process of words' memorization. Along with that, teachers claimed that personalized games help in reaching each student's needs and entice the unwilling learners' interest as they engage the majority of learners in the learning process. However, some teachers claimed that not all learners were engaged.

The application of the personalized-games-based-learning approach in teaching vocabulary

The majority of teachers advertised that personalized games made vocabulary learning smooth and effective as it promoted a better understanding and long retention of vocabulary. Teachers noticed that the learned vocabulary was unforgettable and students tend to use words correctly in different contexts as they have detected an improvement in writing tasks and a better understanding of reading materials.

The impact of the personalized-games-based-learning approach on students' psychology (emotions, behaviour, and motivation)

Most of the teachers observed positive psychological and behavioural changes when using personalized games. Learners were motivated, excited, and eager to learn. Teachers delineated that games opened the appetite for searching and learning. Besides, teachers declared that games evoke positive emotions as learners were more involved emotionally and they were feeling happy, enthusiastic, and more confident to take part in learning. The noisy students were motivated and busy with winning the
games, disruptive learners were more interested in learning and ready to discover which game is the next. Games have even invited shy and intrinsic learners into the learning process and promoted collaborative learning, also, learners had fun and enjoyed learning.

Comparison of personalized-games-based learning approach and the traditional way of teaching

The majority of teachers have noticed improvement when applying the PGBL approach. Students assimilated input efficiently as they recalled vocabulary more easily in comparison to when using translation or repetition. All the different learners were engaged in the learning process. Learners were more motivated and autonomous as they were making more effort to win the game, to use the language, and to learn. Students become accustomed to creativity and innovation as the PGBL approach brings novelty and variety in comparison to the traditional stagnant way of learning.

Teachers claimed that when applying PGBL poor learners were more involved, more comfortable, and they felt less separated in comparison to the standardized way of learning as games were personalized according to their level. Besides, teachers declared that morelesson's objectives were achieved with fewer efforts made since personalized games provide students with motley learning opportunities. Furthermore, the majority of teachers noticed that students performed better in tests when using PGBL in comparison to when using the traditional way of teaching. Nevertheless, a minority of teachers declared that they have not noticed any improvement, which implies that not all learners assimilate input through personalized games.

Personalized-games-based-learning approach application in the classroom

PGBL approach efficacy depends to a great extent on the teacher's qualifications and competence in managing the classroom. More than half of the participants claimed that the PGBL application is easy, however, almost half of the participants declared that it was difficult to apply PGBL. PGBL approach application requires mastery and a set of effective strategies as suggested by teachers:

-The use of group work with a leader.

-Involve students in the teaching process.

-Bring concrete and real-life examples of games.

-Time management and planning.

PGBL approach Disadvantages

-It evokes the noise.

-Time-consuming.

-Loss of students' control.

-Not easy to implement.

-Students take it less seriously as they only want to have fun.

-It distracts some students' attention.

Is PGBL a waste of time?

All the teachers agreed that personalized games are not a waste of time if well managed. It depends on the teachers and their competencies in making games more beneficial. Also, it depends on learners' way of perceiving games as some learners want just to have fun. Some teachers approved that games could even be time gaining.

3.2.1.2 EFL learners' questionnaire

Students' vocabulary learning

The majority of learners announced that they have difficulties in memorizing words as there are too many synonyms. These students used memorization and repetition to learn vocabulary. Most of the learners prefer the traditional method to learn, mostly translation, synonyms, and games.

The efficacy of games in reinforcing vocabulary retention

The majority of students claimed that they recalled vocabulary for a longer period as it facilitates the process of storing and retrieving input. However, a small minority claimed that they have not recalled words for a longer time, which implies that not all learners assimilate input through games.

The efficiency of educational games in learning vocabulary

All students declared that it is a good method to learn vocabulary quickly and effectively as it facilitates understanding and motivates them to learn more. The majority of learners reported that they learned a lot of vocabulary when learning through educational games, and

they felt both like learning and having fun. However, the minority of students felt like they are just having fun without learning a word, which implies that some learners do not take it seriously.

The impact of educational games in increasing motivation and appeasing negative emotions

Most students acknowledged that games increased their motivation by making learning interesting and not boring since the majority of youth love to play. Besides, students who suffered from anxiety and inhibition claimed that games helped them abate their anxiety and stress, and it encouraged them to get involved in learning. The majority of learners proclaimed that they felt happy, comfortable, and satisfied when playing vocabulary games. However, a small minority reported that they have not noticed any changes when using games, which implies that not all learners enjoy playing games.

The comparison of learning through educational games and the traditional way of teaching

The majority of learners advertised that learning vocabulary through games was more enjoyable and more comfortable, and they were more satisfied with the results and their performance in comparison with the traditional way of learning.

3.2.2 Interview Results

3.2.2.3 Educational psychologists' interview

The efficacy of educational games in facilitating vocabulary retention

All psychologists agreed that educational games have a great role in vocabulary learning as it reinforces retention and recall of words. The psychologists explained that games link between the word and the image, which provides learners with a better illustration and visualization of the words. Eventually, the learner will adapt to the word and have a complete understanding and assimilation, which leads to strong memorization.

The capacity of educational games in increasing students' positive emotions

All psychologists claimed that games eliminate boredom and induce positive emotions because play is a process of spending energy, which consumes negative emotions and regulates stress. Psychologists added that in games there are freedom, play, and pleasure,

which automatically increase positive emotions and happy hormones. However, this capacity depends to a large degree on the teacher-student relationship.

The impact of educational games in decreasing students' negative emotions and behaviours

All psychologists agreed that games mollify negative emotions like fear, stress, and anxiety...etc. In educational psychology, games are used to treat unhealthy behaviours because they quell negative feelings and emotions. Also, students with bad behaviours: Disruptive, talkative, and noisy students, they need attention and interest. Therefore, games make these students feel well regarded, respected, and useful since it includes them in the process of solving a problem, finding the answer, and make their team win, therefore, they develop a positive attitude. Along with that, shy and intrinsic students are invited to get involved in the process of learning. Furthermore, games help students with ADHD to spend their extra energy in play, and in enticing

their attention and interest. However, educational games do not work spontaneously as they require teachers' guidance.

The impact of educational games on increasing students' motivation

All psychologists agreed that educational games boost learners' motivation because it brings variety and novelty, which sparks students' curiosity, and increases the desire to learn more. Also, the psychologists claimed that since educational games improve input assimilation, it improves learners' performance and results, which motivates and encourages students to make more effort.

The impact of educational games on increasing attention

All participants agreed that games make learners more attentive and interested in learning. Students detest routine and stagnation, but games are full of novelty and action as they include different colours, shapes, and activities, which captivates students' attention. Besides, educational games create interactivity between the game, the students, and the teacher, which helps learners stay focused. However, teachers need to guide learners throughout the process of playing educational games.

The impact of content's personalization on students' learning

All the psychologists agreed that personalization of content has a great impact on improving learning as it provides the academic setting with different means of learning and responds to learners' different needs, preferences, and learning styles. Psychologists declared

that every little attention the teacher provides to the learner has ample merits, and teachers have to give more attention to poor learners.

3.3. Interpretation of results

This research aims to answer the following research question: How does PGBL impact EFL learners' vocabulary learning and learners' psychological health?
The following sub-questions were generated for a more proud investigation:

- To what extent does the PGBL approach facilitate vocabulary learning for EFL learners?

- Does the PGBL approach have a positive impact on learners' psychology and well being (emotions, and behaviours)?

- Does the PGBL approach increase learners' attention and motivation?

- Does the PGBL promote a healthy, supportive learning atmosphere?

To answer the above question the following hypothesis was developed along with these sub-hypotheses:

- PGBL promotes vocabulary acquisition as it eases vocabulary processing in learners' brains.

-PGBL maintains a safe, supportive, and healthy environment.

- PGBL evokes positive feelings, which abates stress level and alleviates anxiety.

- PGBL aids learners to be more focused and attentive, and it increases motivation.

This research aimed to investigate PGBL importance in facilitating vocabulary learning from teachers' and learners' experiences. Furthermore, the main focus of this study was to get an in-depth understanding of the impact of PGBL on learners' psychological health (emotional and mental health) in educational settings through interviewing educational psychologists. Moreover, the final objective of this research was to compare the PGBL approach qualifications in assisting EFL students' vocabulary learning and promoting a healthy learning atmosphere with the traditional way of teaching. Therefore, after conducting this survey, the following answers were established:

PGBL approach facilitates vocabulary retention in learners' memory

These research findings show that games aid vocabulary processing and retention in learners' memory. As elucidated by Educational psychologists, games associate the word with its image, which provides a clear illustration and visualization of the word, a greater understanding, and robust memorization. The same results were indicated in the theoretical part of this research and validated by Al Neyadi (2007) as he advertised that games allow students "to pause and think about the words" and decide "whether to compare, contrast, match or draw pictures which represent them" (p. 3).

Games present vocabulary input in different modalities: visual in a picture, auditory in a video or a tape, or physically in role-playing, which delineates words' meaning comprehensively and eases words' processing and consolidation. Similar to what, Virginia French Allen (1983) declared in her book "Techniques in Teaching vocabulary" that vivid and lively experiences are the best vocabulary instructor.

Along with that, this study's findings indicate that the personalization of content improves learning as teachers noticed clear progress in students' performance in tests. According to educational psychologists content's personalization makes learners feel comfortable learning through their preferred learning styles, and it satisfies their different needs, which automatically enhances input processing and learning. Similar to these findings, Zull (2002) in his book "The art of changing the brain" proved biologically how the brain makes great progress when the one uses the part of the brain he/she enjoys as when learning through the one's preferable learning styles, which according to Zull (2012) deepens and strengthens learning.

In this research, we combine games and personalization to heighten personalized games' dual efficacy in strengthening vocabulary in learner's memory and simultaneously satisfying the learner's needs. However, a minority of participants have not noticed any improvement when learning vocabulary using personalized games, which implies that not all learners process input through games and not all learners enjoy playing games. This indicates that the teacher has to have thorough knowledge about his students' differences so he can tailor his teaching approach to abut each learner's needs.

PGBL approach increases positive emotions

The findings of this research have shown that personalized games arouse positive emotions. Findings demonstrate that games incorporate freedom, play, pleasure, and action.

This freedom to play, to move, to win and lose without being judged generates positive emotions and feelings. Similar to these findings, a study by ("The Science Behind Game-Based Learning," 2019) exhibited that games adjust emotions and activate happy hormones like serotonin, dopamine, and endorphin. Along with that, when playing games learners spend energy and make efforts to win the game and they are achieving something, which is fun and prompts their positive emotions.

As mentioned in the literature review, Zull (2002) explained how action, like in games, or merely thinking about movement like when making progress stimulates brain structures responsible for happiness, pleasure, and in generating positive emotions. Furthermore, similar to what Kristof declared in his study (1996), personalization develops productivity and positive emotions, as this research data have indicated, learners appreciated learning through personalized games, which encouraged them to make more efforts and strive to succeed. In addition to that, learners have enjoyed learning and demonstrated a positive attitude.

PGBL approach decreases negative emotions (stress, anxiety), and behaviours

This research's findings have demonstrated that personalized games assuage negative emotions and dilute stress and anxiety. Students have commented on how
using games in learning soothes their pressure and fear, and psychologists have explained that games are used in educational psychology to treat unhealthy behaviours. Similar to these findings of Richard-Amato (1988) and Dewey (1897) claimed that personalized games oust negative feelings and "lower anxiety, thus making the acquisition of input more likely" (p. 147).

This study's findings have shown that personalized games create a relaxed and friendly learning setting, where learners feel comfortable to learn, play, and have fun. When playing educational games learners are so occupied with solving the game so they forget about their worries and concerns. Besides, most of the games require physical action, which absorbs all the extra energy from ADHD students and disruptive students by involving them in the learning-play process.

Teachers have proclaimed that games have appeased learners' fear and inhibition since it has invited intrinsic and shy students to take part in the learning process. The same findings were advertised by Abdikhah (1998) as he claimed that personalized games abate inhibition and reticence and learners who have no bravery to sound their voices will feel stress-free and

judgment-free. Abdikhah added that games encourage learners to participate and get engaged in learning. This ascribes games' virtue in making all the different learners feel comfortable and complacent when learning because they are free to move, talk, laugh, and make mistakes since mistakes are a necessary detail to win the game.

PGBL approach increases learners' motivation

This research's participants confirmed that personalized games substantially boost students' motivation and the desire to learn. Personalized games make learning interesting and attractive as it brings variations and novelty in terms of rules, design, shapes, colours, and activities, which sparks students' curiosity and kindle the flame of learning. In like manner, Peirce and Wade culminated in their research (2011) that games ambience is intrinsically promoting and motivating due to its variety of content and activities: narrative text, videos, images, colours, and shapes, which offers a valuable learning experience to learners.

Furthermore, this research's findings justified that personalized games help learners progress in their learning, and improve their performance in tests, which inherently motivates learners to make more effort to learn more and achieve more. This implies that personalized games are an effective educational tool that motivates and engages different learners as Dolati and Mikaili (2011) concluded.

PGBL approach increases learners' attention

The findings of this study show that personalized games entice learners' interest and attention. The personalization of games makes learning all about learners as it approaches each learner through play, and it helps learners process input through their preferable modality, which keeps learners' interest in learning always high. Since learners become interested in the learning materials, they will automatically devote all their attention to the content because interest calls for attention.

Moreover, games break the routine and classroom's stagnation as most of the time games require action and suffuses the learning atmosphere with diversity and change, which is of interest to learners. Similar research carried by Rutherford, Nicolson and Arnold in (2006) concluded that physical movement, as in games, activates the cerebral cortex responsible for attention and concentration, which helps learners, especially learners with ADHD, stay focused and attentive in the classroom.

The classroom is full of distractions as boredom, talkative students, noise...etc, which wanes learners' concentration in long period tasks, however, personalized games' can dwindle boredom and increase attention due to its miscellaneous design and content. Correspondingly, Bakhsh (2016) advertised that movement and physical actions in academic settings help learners stay attentive and focus on long period tasks.

The role of teachers in the application of PGBL

This study's findings emphasized the role of teachers in guiding students throughout the process of playing educational games. Teachers have a potent eminence in enhancing games efficacy or wane it as games do not function spontaneously. Teachers need mastery and a set of effective strategies that help learners concentrate and stay focused on the game, otherwise, if the teacher loses control of the classroom, games would bring more harm than good.
Similar to these findings, Ulicsak and Williamson (2010) insisted that "if the teacher does not take an active role when facilitating the game, and there is no purpose for using the game, then the learning will be ineffective" (p.39). By the same token, Kenny and Gunter in (2011) and Koh, Kin, Wadhwa, and Lim in (2012) declared that the teacher is the one who guarantees games' success.

PGBL promotes a healthy and supportive learning atmosphere

Learners are diverse and special in the way they learn, think, and process input. Each learner enjoys learning through a specific type of intelligence and learning style. These new generations of learners escape stagnation and ennui as they feel more comfortable learning in flexible active environments where they feel free to move, play, and learn. However, academic settings mostly forbid movement, play, and noise. The traditional way of teaching, the one size fits all approach, does not acknowledge
learners' heterogeneity as knowledge is presented to all students in a like manner. games' design facilitates vocabulary consolidation in learners' memory.

The findings of this survey show that the personalized-games-based-learning approach paves the way for an advantageous and valuable learning experience. Personalized educational games have ample merits from consolidating vocabulary input in learners' memory to appeasing learners' stress, fear, and anxiety and evoking a bundle of positive emotions and happy hormones. Along with that, personalized games foster a colourful learning ambience regarding the lesson content, activities, and materials as input is presented

in a fun environment, which beguiles learners' interest, and helps them stay focused and attentive.

Furthermore, PGBL is an approach that can be easily adapted to learners' different styles of learning, and needs. An approach that caters to students' emotions, and the way they feel in the classroom. An approach that is tailored by the teacher to respect students' discrepancy in the matter of learning styles, level of aptitude, capabilities, and background. An approach that promotes a friendly atmosphere that fosters learning, especially, vocabulary learning. An approach that provides an environment where students can play and have fun while learning. An approach that is a play-learning-ground.

In relation to that, personalized educational games bring to the classroom an intrinsically motivating atmosphere where learners feel eager to learn and make more effort to progress and improve further. All of the last-mentions points lay the foundations to a healthy learning environment where learners do not feel intimidated or reluctant to raise their hands or make mistakes as they are free to move, to play, and to process input through the modality they enjoy the most. Over and above, this healthy environment supports and encourages learners to endeavour and seek further success.

In PGBL, educational games are geared to satisfy learners' various needs. The design of games is conducted by the teacher based on what he knows about his students' characteristics. More specifically, in this research, the PGBL approach is used to teach merely English vocabulary in a personalized learning environment by virtue of its vigour in consolidating words in learners' memory, acclimatizing to learners' heterogeneity, and evoking positive emotions. More than that, in PGBL every game's component and element are adjusted according to learners' needs and characteristics. In respect to that, the PGBL approach paves the way for an educational, entertaining environment voided of stress, fear, and negative emotions.

3.4. Limitations

The findings of this research study are subject to two major limitations:

Lack of previous studies in the research area

Throughout the process of building the theoretical foundation of this research, we faced a lack of references and documents about personalized-games-based-learning since it is a

recent approach that is rarely to never tackled. Most of the works that have been done before were about games-based-learning or personalized learning, which hindered, slowed, and confused the progress of collecting information. Merely few journals and articles dealt with personalized educational games, Therefore, we had to amalgamate both personalized learning and educational games' merits in enhancing learning along with PGBL's recent studies to collect relevant and meaningful information.

The corona-virus pandemic: Limited access to respondents, the insufficient sample size for statistical measurement, and time constraints

Due to the inconvenient circumstances with the corona-virus (**COVID**-19), we faced difficulties in accessing schools and respondents. It was planned to have an experiment in Benzerdjeb Benaouda middle school, and a pretest and a post-test before and after using personalized games in teaching vocabulary. However, we had not the time to go to the school before the lockdown as we finished exams and exams' papers consultations by mid-February, and schools were locked by march. Therefore, we had restricted access to participants, thence, we opted for online questionnaires and face-to-face interviews.

The teachers' questionnaires were shared on Facebook groups the same as students' questionnaires. Nevertheless, middle school teachers were not responding, merely two or three teachers answered, and we had no access to middle school students so we shared the questionnaires with high school teachers and students. Along with that, we had access to a very narrow number of teachers from Mostaganem. Hence, we selected participants from different places and schools: teachers from different cities in Algeria, and students from different high schools in Mostaganem. However, we elected the students of the teachers from Mostaganem who answered the questionnaire. Since the research is about PGBL efficacy in teaching EFL learners in general, not merely young learners, we selected participants from different High schools (teachers and students) because it will not affect the results.

3.5. Recommendations

Curtail the use of translation and memorization to teach vocabulary

Based on the data generated from students' questionnaires, most students use translation and memorization to acquire vocabulary, which is most of the time misleading and irrelevant. Translation often does not offer the accurate meaning of words as it provides a word for word interpretation, which confuses learners' understanding and use of the word when it is in a

different context. It is high time teachers implemented more practical and advanced methods to teach vocabulary such as personalized games. Games display words' diverse meanings in multiple contexts and through concrete examples, which facilitates vocabulary consolidation and use.

Introduce personalized games in the English textbook

The traditional way of teaching, the one size fits all approach does not consider learners' differences and needs, moreover, it renders the learning environment boring and stagnant. Learners' attention declines after several hours of sitting in the same place absorbing all kinds of information, and they lose the desire to learn. Ergo, the teacher should customize the lesson's content in a way that is easily embraced by the
different learners and he/she should make the learning environment more fun and vivid to instigate and maintain learners' attention and interest, and to reach more learning objectives. Therefore, it is recommended for textbook designers to include personalized games in the textbook to encourage the teacher to use games more often and to facilitate the learning process for students, and the teaching process for teachers.

The use of effective strategies to implement personalized games in the classroom

The teacher's way of employing games in the classroom defines its effectiveness: it either reinforces or abates its efficacy. Personalized games' implementation requires mastery and a set of strategies the teacher has to employ when applying games as games do not function spontaneously. Besides, the teacher has to have a thorough knowledge of how to implement games, what kind of games to implement, how to manage and organize the classroom, and how to prepare students before playing games.

The teacher needs to give comprehensive instructions to students about games' design, rules, and way of playing as he/she should bring games that correspond to students' level and preferences. When implementing personalized games, the teacher has several roles to play: a guide, facilitator, a manager, an information provider, and a distraction controller. When the students understand how the game functions, they will make the necessary efforts to win the game and get more advanced results.

Explain to learners games' objectives

Some learners do not take games seriously as they see it merely as a tool to have fun. However, the teacher should explain the objective behind playing games in the classroom as

he/she should set specific learning goals that need to be reached by the end of the lesson. Students have to understand that these games aim to facilitate learning and to make them enjoy learning, which means that these games are within an academic context that must be respected. To reduce noise and distractions, before playing the games, the teacher should set rules, restrictions, and punishment so that learners adhere to these rules.

Training teachers on how to employ games

To render PGBL an effective approach, teachers have to be trained on how to use games. The government should provide teachers with a thorough training through which they acquire the adequate techniques, skills and strategies to employ games effectively. These skills and techniques will help teachers manipulate games more easily as it will facilitate games' application and integration in the teaching process. This training can be undertaken in the form of a pre-service professional training program or work-shop where teachers for an extended period get a thorough understanding and knowledge about educational games' benefits and application. To guarantee games' effectiveness and promote successful learning, learners need to get the appropriate assistance and adequate support from teachers, which requires teachers' comprehensive mastery and familiarity with games. As well as, this training will motivate teachers to use games regularly in the classroom since it will uncover games' benefits, efficacy and advantages.

3.6 Future research directions

Some further questions need to be investigated concerning PGBL to enhance and broaden its efficacy to different learning aspects. This research study gathered empirical evidence merely about teaching vocabulary using PGBL. However, more empirical data should be collected concerning PGBL's efficacy in teaching reading, writing, speaking and other skills. In addition, future research should determine how much control should be given to learners in a personalized learning environment to guarantee PGBL efficacy and achieve prosperous learning. Moreover, the different skills and learning strategies learners need to acquire to meet the intended learning objectives and outcomes should be investigated through comprehensive investigations.

3.7. Conclusion

This chapter aims to answer these research questions by summarizing the different data obtained and interpreting the findings that form the basis of this research. Along with that, the

different limitations that highlight these results are demonstrated besides the recommendations for future research. This research attempts to weigh the PGBL approach's impacts on EFL learners' vocabulary learning and psychology. The obtained findings confirm the proposed hypotheses that imply that PGBL facilitates vocabulary retention in learners' memory, decreases negative emotions, increases positive emotions; motivation; attention, and promotes a healthy supportive learning atmosphere.

General conclusion

The one size fits all approach foists on learners to ingest input in a like manner, and spend hours in one seat regurgitating all sort of information as passive recipients. This traditional way of teaching does not acknowledge learners' dissimilarity, and the need for movement and fun to enliven the learning ambience. Under the same conditions, language learning in a stagnant and boring purlieu brings limited and ephemeral academic results. With this argument in mind, the PGBL approach paves the way to a more vivid, and entertaining academic setting that facilitates learning and imbues learners with positive feelings. More precisely, the PGBL approach eases the process of words' retention and consolidation when learning vocabulary, which is assumed to have a supreme eminence to reach fluency in language learning. Truly, PGBL is a constructive and promising teaching approach that respects learners' differences as it fine-tunes the learning content according to their miscellaneous needs and preferences.

This research was an attempt to weigh the extent to which a personalized-games-based-learning approach leads the way to a valuable and constructive vocabulary learning experience for EFL learners. This survey study was conducted through a binary methodology to test and answer this research's hypotheses and questions. The primary purpose of this research was to appraise the PGBL approach qualifications in easing the process of vocabulary consolidation in learners' memory. Another core purpose was to estimate PGBL vigour in invigorating the academic milieu through evincing positive emotions and evicting negative feelings along with increased motivation and attention.

Chapter one enunciated the theoretical foundation of this research. An overview of vocabulary definition and its importance in language learning was given. Along with that, the different methods of teaching vocabulary were reported. Moreover, the chapter discussed personalized-games-based-learning approach definition, importance, and potency in teaching vocabulary. Accordingly, the discussion is given from an educational, cognitive, and Psycho-neurobiological perspective. To wind up the discussion, the chapter detailed the way educational games are designed, the types of games to use in the classroom and the teacher role when implementing games.

Chapter two brought to light the methodology followed in undertaking this research study. The type of research and method of sampling were reported along with the sample

selected to participate in the research. Thereafter, the type of research and methodology were considerably described along with the binary data collection instruments, namely, interviews and questionnaires. In the aftermath, the data collected were thoroughly analyzed and presented in graphs and charts.

The last chapter outlined the summary of the data collected from each instrument: interview and questionnaire. Accordingly, the different data obtained were interpreted and discussed. Moreover, the chapter discussed the limitations that impeded the process of gathering data, namely the paucity of resources, limited access to respondents, insufficient sample size, and time constraints. Moreover, the chapter expounded the recommendations for a more effective PGBL implementation and future research directions.

The results of this study ostended that the implementation of the PGBL approach in the learning settings provides learners and teachers with an advantageous and valuable academic experience. As the findings revealed, personalized games' design facilitates vocabulary retention, processing, and retrieval in learners' memory since it allows learners to process input through their preferable modality. Moreover, the personalized games' ambience and variety in design, regarding the shapes, colours, movement, and content elicit positive emotions and trigger happy hormones to increase. In the same way, this diversity in the design increases learners' attention and motivation to learn and make efforts to succeed. By the same token, personalized games' active environment hampers all sorts of negative emotions such as anxiety, stress, and fear since it consumes learners' negative energy and loads them with positive feelings. Personalized games are designed in a way to conform to learners' differences in needs, learning styles, educational levels, abilities, and types of intelligence, which makes learners feel important and cared for. Therefore, learners will devote all their interest and attention to the game and the learning content, which encourages them to get engaged in the learning process and improve their performance.

The obtained results answered the research question and validated the proposed hypotheses as all the different participants declared that the PGBL approach facilitates vocabulary learning and word consolidation in learners' memory. Moreover, PGBL gives rise to positive emotions, happy hormones, motivation, and attention as it hinders negative emotions and energy, which enhances learners' psychological health and well being. Therefore, this approach promotes a fun, healthy, and supportive learning environment as assumed in the hypotheses.

This research aims to answer a definite number of questions about the efficacy of the PGBL approach in the educational settings as it does not by any means encourage to discard or abandon the traditional methods of teaching. However, this research calls for the necessity to bring variety, novelty, and movement to the classroom and to consider and respect learners' differences in learning. Along with that, it is an attempt to change the classroom into a fun environment where learners feel comfortable to move, play, laugh, and learn synchronously. Our study invites teachers and the educational system to adopt a teaching approach through which the teacher can reach the different learners easily and effectively. PGBL approach promotes a healthy educational environment where learners can have a great time learning vocabulary as they will not feel intimidated to mistake or err. Furthermore, in an EFL academic setting, PGBL can serve as a great educational tool to enhance vocabulary teaching and learning. On the other hand, this paper invites future researchers to investigate further questions about PGBL efficacy in teaching reading, writing, speaking and other skills.

List of References

10 Games to Play with any Vocabulary Words. (2019). Diary of a Not so Wimpy Teacher. https://www.notsowimpyteacher.com/2016/11/10-games-to-play-with-any-vocabulary.html

A National Conversation about Personalised Learning. (2014). A National Conversation about Personalised Learning. the Department for Education and Skills. www.standards.dfes.gov.uk/personalisedlearning

Abdikhah, S.H. (1998). The effect of language games on vocabulary improvement (Unpublished MA thesis). Tarbiat Modarres University, Tehran.

Al Neyadi, O.S. (2007). The Effects of Using Games to Reinforce Vocabulary Learning. In Gallagher, K. & Bashir-Ali, K. (Eds.), Action Research and Initial Teacher Education in the UAE (pp. 99-107). UAE: HCT Press.

Alqahtani, M. (2015). The importance of vocabulary in language learning and how to be taught. International Journal of Teaching and Education. *3(3)*. https://doi.org/10.20472/TE.2015.3.3.002

Al-Razgan, M., & Alotaibi, H..(2019).Personalized Mobile Learning System to Enhance Language Learning Outcomes. Indian Journal of Science and Technology, *12(1)*. https://doi.org/10.17485/ijst/2019/v12i1/139871

Aslanabadi, H., & Rasouli, G. (2013). The effect of games on improvement of Iranian EFL vocabulary knowledge in kindergartens. International Review of Social Sciences and Humanities, 6(1), 186-19

Ayaz, Y., & Genc, Z. (2016).Digital game-based language learning in foreign language teacher education. (2016). Turkish Online Journal of Distance Education, *17(4)*. https://www.semanticscholar.org/paper/The-Effects-of-Using-Games-to-Reinforce-Vocabulary-Neyadi/e14b59cd8c1366d6752321b6fc108b1060733ca4

Bakhsh, S.A. (2016). Using Games as a Tool in Teaching Vocabulary to Young Learners. Canadian Center of Science and Education, *9(7)*. https://doi.org/10.5539/elt.v9n7p120.

Beena, A. (2011). Teaching Vocabulary Through Games-a Sanguine Step. Journal on English Language Teaching, *1(4)*. SDNB Vaishnav College, Chennai.

Benoit, M. (2017). The Effect Of Game-based Learning On Vocabulary Acquisition For Middle School English Language Learner (Unpublished doctoral dissertation). Liberty University, Lynchburg, VA.

Boumová, V. (2008). Traditional vs. modern teaching method: Advantages and disadvantages of each. (Unpublished master's thesis). Brno, Czech Republic: Masaryk University.

Bromley, K. (2007). Nine things every teacher should know about words and vocabulary instruction. Journal of Adolescent & Adult Literacy, *50(7)*, 528-529, 531-537. https://doi.org/10.1598/JAAL.50.7.2

Bruner, J. (1985). The role of interaction formats in language acquisition. In J. P. Forgas (Ed.), Language and social situations (pp. 31–46). New York, NY: Springer.

Burns, M. K., & Ysseldyke, J. E. (2009). Reported prevalence of evidence-based instructional practices in special education. Journal of Special Education, *43(1)*, 3–11.

Brown, C. (2019).The history of personalized learning. Classcraft. https://www.classcraft.com/blog/features/the-history-of-personalized-learning/

Carlo, M. S., August, D., Mclaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., & White, C.E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. Reading Research Quarterly, *39(2)*. Retrieved from: http://www.jstor.org/stable/4151671

Cherry, K., 2019, Overview of VARK Learning Styles: Which Learning Style Do You Have?. Verywell Mind. https://www.verywellmind.com/vark-learning-styles-2795156

Chick, N. (2020). Learning styles. Vanderbilt University. https://cft.vanderbilt.edu/guides-sub-pages/learning-styles-preferences/

Combine qualitative and quantitative data. (2018). Better Evaluation. https://www.betterevaluation.org/en/rainbow_framework/describe/combining_qualitative_and_quantitative_data

Cronbach, L., and Snow, R. (1977). Aptitudes and Instructional Methods: A Handbook of Research on Interactions. Inrington Publishers.

Darfilal, I. (2014). The Effectiveness of Using Language Games in Teaching Vocabulary The Case of Third Year Middle School Learners (Unpublished Master thesis). University of Tlemcen, Tlemcen.

Dehaan, J., Reed, W.M., & Kuwada, K. (2010). The effect of interactivity with a music video game on second language vocabulary recall. Language Learning & Technology, *14(2)*, 74–94.

Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: A systematic mapping structure. Journal of Educational Technology & Society, *18(3)*, 75–88.

Djoub, Z. (2019). Personalized learning. Lecture note. Abdelhamid Ibn Badis University. Delivered in November 2019.

Egounleti, P.M. (2018). Practical Strategies To Teach Vocabulary Through Games In Efl Beginner Classes: The Case Study Of Some Secondary Schools In Abomey Region. International Journal of Education and Research, *6 (12)*.

El-Shamy, S. (2001). Training Games: Everything You Need to Know about Using Games to Reinforce Learning. Virginia: Stylus Publishing, LLC.

Foil, C. R., & Alber, S. R. (2002). Fun and effective ways to build your students' vocabulary. Intervention in School and Clinic, *37(3)*, 131-139. https://doi.org/10.1177/105345120203700301

Foreman, J. (2003). Next-generation educational technology versus the lecture. Educause Review, 12-22. Retrieved from http://er.educause.edu/~/media/files/articledownloads/erm0340.pdf

G¨obel, S., Wendel, V., Ritter, C., Steinmetz, R. (2010). Personalized, Adaptive Digital Educational Games using Narrative Game-based Learning Objects. Multimedia Communication Labs - KOM, TU Darmstadt, Merckstr. 25, 64283 Darmstadt, Germany.

Gardner, H. (1999). Intelligence reframed: Multiple intelligences for the 21st century. New York, NY: Basic Books.

Gee, J. P. (2007). What video games have to teach us about learning and literacy (2nd ed.). NewYork: Palgrave Macmillan Trade.

Groff, S, J. (2017). Personalized Learning: The State of the Field & Future Directions. Center for Curriculum Redesign. www.curriculumredesign.org

Guillen-Nieto, V., & Aleson-Carbonell, M. (2012). Serious games and learning effectiveness: The case of It's a Deal!. Computers & Education, *58(1)*, 435–448. https://doi.org/10.1016/j.compedu.2011.07.015

Hammoudi, K.(2019). Chapter Two: Collection Of Primary And Secondary Data "[PDF file]". Retrieved from: https://elearn.univ-tlemcen.dz/course/view.php?id=393

Harmer, J. (1991). The Practice of English Language Teaching: New Edition. New York: Longman.

Harmer, J. (1991).The Practice of English Language Teaching: New Edition. New York: Longman.

Harmer, J. (2008). The Practice of English Language Teaching. England: Pearson Longman. ELT Journal, *63(2)*. http://dx.doi.org/10.1093/elt/ccp007

Hedge, T. (2000). Teaching and Learning in the Language Classroom. Oxford: Oxford University Press.

Hoffman, B., & Nadelson, L. (2010). Motivational engagement and video gaming: A mixed methods study. Educational Technology Research and Development, 58(2), 245–270. http://dx.doi.org/10.1007/s11423-009-9134-9

Honarmand, B., Rostampour, M., & Abdorahimzadeh, J. (2015). The Effect of Game Tic TAC Toe and Flash Cards on Zero Beginners' Vocabulary Learning. International Journal of Educational Investigations, *2(3)*, 27-41.

Hornby, M. S. (1995). The Turns of Translation Studies: New Paradigms or shifting viewpoints. John Benjamins Pub Co.

Hui-Chan, L., & Chen, M. (2012). Effects of vocabulary games on lexical growth and retention of low-motivated EFL learners in Taiwan. Asia-Pacific Education Researcher (De La Salle University-Manila), *21(3)*, 564-575. Retrieved from http://link.springer.com/journal/40299

Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. Perspectives on Psychological Science, *2(1)*, 260–280. http://dx.doi.org/10.1111/j.1745-6916.2007.00044.x

Izard, C. E. (2009). Emotion theory and research: Highlights, unanswered questions, and emerging issues. Annual review of psychology, *60(1)*.

Jan L. Plass; Bruce D. Homer; Charles K. Kinzer. 2015. Foundations of Game-Based Learning. Educational Psychologist, *50(4)*. http://dx.doi.org/10.1080/00461520.2015.1122533

Joiner, R., Iacovides, J., Owen, M., Gavin, C., Clibbery, S., Darling, J., & Drew, B. (2011). Digital games, gender, and learning in engineering: Do females benekhanfit as much as males? Journal of Science Education and Technology, *20*, 178-185. http://dx.doi.org/10.1007/s10956.010.9244.5

Jung, J., Graf, S. (nd). An Approach for Personalized Web-based Vocabulary Learning through Word Association Games. National Science Council of the Republic of China, Taiwan, under Contract No. NSC 097-2811-S-008-001-.

Kapp, K. M. (2012). The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education. San Francisco: Pfeiffer.

Kapp, K. M. (2016). Choose your level: Using games and gamification to create personalized instruction. In M. Murphy, S. Redding, & J. Twyman (Eds.), Handbook on personalized learning for states, districts, and schools (pp. 131–143). Philadelphia, PA: Temple University, Center on Innovations in Learning. Retrieved from www.centeril.org

Kenny, R., & Gunter, G. (2011). Factors Affecting Adoption of Video Games in the Classroom. Journal of Interactive Learning Research, *22(2)*, 259–276

Khan, R., Radzuan, R., Shahbaz, M., Ibrahim, A., & Ghulam, M. (2018).The Role of Vocabulary Knowledge in Speaking Development of Saudi EFL Learners. Arab World English Journal (AWEJ), 9(1). http://dx.doi.org/10.31235/osf.io/68gwj.

King, D. (2019). The science behind game-based learning - growth engineering. Growth engineering. Co.Uk: Growth Engineering. https://www.growthengineering.co.uk/the-science-behind-game-based-learning/

Kinzie, M. B., & Joseph, D. R. D. (2008). Gender differences in game activity preferences of middle school children: Implications for educational game design. Educational Technology, Research, and Development, *56(6)*, 643-663. http://dx.doi.org/10.1007/s11423-007- 9076-2

Koh, E., Kin, Y. G., Wadhwa, B., & Lim, J. (2012). Teacher Perceptions of Games in Singapore Schools. Simulation & Gaming, *43(1)*, 51–66. http://doi.org/10.1177/1046878111401839

Korczyn, A. D., Peretz, C., Aharonson, V. & Giladi, N. (2007). Computer based cognitive training with mind fit improved cognitive performances above the effect of classic video games; prospective, randomized, double-blind intervention study in the elderly. The 8th International Conference AD/PD 2007, Salzburg, Austria.

Krashen, S. D. (1985). The input hypothesis: Issues and implications. New York: Longman.

Kristof, AL. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. Personnel Psychology, *49(1)*. https://doi.org/10.1111/j.1744-6570.1996.tb01790.x

Laufer, B. (1997). What's in a word that makes it hard or easy: Some intra-lexical factors that affect the learning of words. In N. Schmitt., & M. McCarthy (Eds.), Vocabulary: Description, acquisition and pedagogy (pp. 140– 155). Cambridge: CUP.

LeDoux, J. (1996). The Emotional Brain. New York: Simon and Schuster, 1996.

Lewis, M. (1993). The lexical approach: The state of ELT and the way forward. Hove, England: Language Teaching Publications.

Lightbown, P., M., Spada N. (1999). How languages are learned. Oxford: Oxford University Press.

Mat Zin, A Z., Wong, S Y. (2008). Game based learning model for history courseware: A preliminary analysis. International Symposium on Information Technology, Kuala Lumpur. http://doi.org/10.1109/ITSIM.2008.4631565

Maximo, R. (2000). Effects of rote, context, keyword, and context/ keyword method on retention of vocabulary in EFL classroom, Language Learning, *50 (2)*, 385-412.

Mayer, R. E. (2014). Computer games for learning. An evidence-based approach. Cambridge, MA: MIT Press.

McKeown, M. G., & Beck, I. L. (2004). Direct and rich vocabulary instruction. In J. F. Baumann & E. J. Kame'enui (Eds.), Vocabulary Instruction (pp. 13-27). Retrieved from http://www.learner.org/workshops/teachreading35/pdf/vocab_Instruction.pdf

Mitra, S., Rana, V. (2001). Children and the Internet: Experiments with minimally invasive education in India, The British Journal of Educational Technology, *32(2)*, pp.221–232.

Murphy, M., Redding, S., & Twyman, J. (Eds.).(2016). Handbook on Personalized Learning for States, Districts, and Schools. Center on Innovations in Learning, Temple University, Philadelphia, PA.

Neuman, S. B., & Dwyer, J. (2009).Missing in action: Vocabulary instruction in pre-k. The Reading Teacher,*62(5)*, 384-392.

New Classrooms. (2014). A history of personalized learning over the years. New classrooms.Org. https://www.newclassrooms.org/2014/12/14/the-history-of-personalized-learning/

Papastergiou, M. (2009). Digital Game-based Learning In High School Computer Science Education: Impact On Educational Effectiveness And Student Motivation, Computers And Education, *52(1)*, 1–12.

Peirce, N., Conlan, O., Wade, V. (2008). Adaptive Educational Games: Providing Non-invasive Personalised Learning Experiences. Trinity College, Dublin. https://doi.org/ 10.1109/DIGITEL.2008.30

Peirce, N., Wade, V. (2011). Personalised Learning for Casual Games: The 'Language Trap' Online Language Learning Game. 4th European Conference on Games Based Learning 2010. Retrieved from: https://www.researchgate.net/publication/228733556

Pekrun, R. (2000). A social-cognitive, control-value theory of achievement emotions. In J. Heckhausen (Ed.), Motivational psychology of human development: Developing motivation and motivating development (pp.143–163). New York, NY: Elsevier Science. http://dx.doi.org/10.1016/ S0166-4115(00)80010-2

Perrotta, C., Featherstone, G., Aston, H. & Houghton, E. (2013). Game-based Learning: Latest Evidence and Future Directions (NFER Research Programme: Innovation in Education). Slough: NFER.

Pirrie, L A. (2017). Teaching and Learning Vocabulary through Games and Translation in the EFL Classroom: A Case Study (Unpublished Master thesis). Universitat De Les Illes Balears, Palma, Spain.

Pivec. P. (2009). Game-based Learning or Game-based Teaching?. Beta Leading Next Generation. http://www.becta.org.uk

Plass, J. L., & Kaplan, U. (2015). Emotional design in digital media for learning. In S. Tettegah, & M. Gartmeier (Eds.), Emotions, technology, design, and learning (pp. 131–162). New York, NY: Elsevier.

Prensky, M. (2001). Digital Natives, Digital Immigrants. On the horizon, *9(5)*, 1-10.

Ragatz, C. M. (2015). Playing vocabulary games and learning academic language with gifted elementary students (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global. (Order No. 3689691)

Redding, S. (2014). Personal competencies in personalized learning. Philadelphia, PA: Center on Innovations in Learning, Temple University; Charlotte, NC: Information Age Publishing. Retrieved from http://www.centeril.org/publications/Personalized_Learning.pdf

Riahipour, P., & Saba, Z. (2012). ESP vocabulary instruction: Investigating the effect of using a game oriented teaching method for learners of English for nursing. Journal of Language Teaching and Research, *3(6)*, 1258-1266.

Richard-Amato, P. A. (1988). Making it happen: Interaction in the second language classroom: From theory to practice. New York: Longman

Sadeghi, K., & Dousti, M. (2013). The effect of length of exposure to CALL technology on young Iranian EFL learners' grammar gain. English Language Teaching, *6(2)*, 14-26. https://doi.org/10.5539/elt.v6n2pl4

Salen, K., & Zimmerman, E. (2004). Rules of Play: Game design fundamentals. Cambridge, MA: MIT Press.

Sampson, D., & Karagiannidis, C. (2012). Personalised Learning: Educational, Technological and Standardisation Perspective. Unirioja.Es. Retrieved May 24, 2020, from https://dialnet.unirioja.es/descarga/articulo/4544723.pdf

Schmitt, N. (1999). The relation between TOEFL vocabulary items and meaning, association, 325 collocation, and word-class knowledge. Language Testing *16(2),* 189-216

Schmitt, N. (2000). Vocabulary in language teaching. Cambridge: Cambridge University Press.

Schunk, D. (1996). Learning Theories: An Educational Perspective. Englewood Cliffs, NJ: Prentice-Hall.

Shaffer, D. W., Squire, K. R., Halverson, R., & Gee, J. p. (2005). Video games and the future of learning. Phi Delta Kappan, *87(2)*, 104-111. https://doi.org/10.1177/003172170508700205

Sitzmann, T. (2011). A meta-analytic examination of the instructional effectiveness of computer based simulation games. Personnel Psychology, *64(2)*, 489–528.

Sobhani, M., & Bagheri, M. S. (2014). Attitudes toward the effectiveness of communicative and educational language games and fun activities in teaching and learning English. Theory and Practice in Language Studies, *4(5)*, 1066-1073. https://doi.org/10.4304/tpls.4.5.1066-1073

Soltani, R. (2011). Extensive reading: A stimulant to improve vocabulary knowledge. Studies in Literature and Language, *2(3)*, 161-167. https://doi.org/10.3968/j.s11.1923156320110203.018

Taheri, M. (2014). The effect of using language games on vocabulary retention of Iranian elementary EFL learners. Journal of Language Teaching & Research, *5(3)*, 544-549. https://doi.org/10.4304/jltr.5.3.544-549

Taylor, R. D., & Gebre, A. (2016). Teacher-student relationships and personalized learning: Implications of person and contextual variables. In M. Murphy, S. Redding, & J. Twyman (Eds.). Handbook on personalized learning for states, districts, and schools. Philadelphia, PA: Center on Innovations in Learning.

Thornbury, S. (2002). How to Teach Vocabulary. Harlow: Longman.

Thornbury, S. (2002). How to teach vocabulary. United Kingdom: Pearson Education Limited.

Tonzar, C., Lotto, L. & Job, R. (2009). L2 vocabulary acquisition in children: Effects of learning method and cognate status. Language Learning, *59 (3)*, 623-646.

Toth, M. (1995). Children's Games. Oxford: Macmillan.

Uberman, A. (1998). "The use of games for vocabulary presentation and revision", English Teaching Forum, *36(1)*, 253-285.

Ulicsak, M., & Williamson, B. (2010). Computer games and learning: A Futurelab handbook. Retrieved from

http://www.futurelab.org.uk/resources/documents/discussion_papers/Computer_Games_and_Learning_discpaper.pdf\nhttp://admin.futurelab.org.uk/resources/documents/discussion_papers/Computer_Games_and_Learning_discpaper.pdf

Um, E., Plass, J. L., Hayward, E. O., & Homer, B. D. (2012). Emotional design in multimedia learning. Journal of Educational Psychology, 104(2), 485–498. http://dx.doi.org/10.1037/a0026609

Vahdat, S., & Rasti-Behbahani, A. (2013). The effect of video games on Iranian EFL

learners' vocabulary learning. The Reading Matrix, 13(1), 61-71.

Varlas, L. (2012). Academic vocabulary builds student achievement. Education Update, *54(11)*, 1-6. Retrieved from www.ascd.org

Walker, S. (2020.). Difference between census and survey – difference wiki. Difference.Wiki. Retrieved August 24, 2020, from https://www.difference.wiki/census-vs-survey/

Wang, Y. (2005). Approaches to enhancing vocabulary learning in an EFL context: A comparative study (Master's thesis). Retrieved from ProQuest Dissertations & Theses Global. (Order No. MR02195)

What is GBL (game-based learning)?. (2013). EdTechReview. http://edtechreview.in/dictionary/ 298-what-is-game-based-learning

Wilkins, D. A. (1972). Linguistics in language teaching. Cambridge, MA: MIT Press.

Zichermann, G. (2010, November 1). Fun is the Future: Mastering Gamification [Video file]. Retrieved May 14, 2020, from YouTube Google Tech Talks: http://www.youtube.com/watch?v=6O1gNVeaE4g.

Zull, J. E. (2002). The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning (1st ed.). Stylus Publishing.

Appendices

Appendix (1): Teachers' questionnaire

Dear teachers,

The following questionnaire is a part of a research study conducted in the English department of Abdelhamid Ibn Badis University, Mostaganem. The questionnaire is about Personalized-Games-Based-learning impact on learning English vocabulary and promoting a healthy learning environment. Thank you for accepting to answer this questionnaire, your answers will add great value to our investigation.

1-Work experience:

0-3 years ☐

3-5 years ☐

5-10 years ☐

2-Do you think your students are fluent in the English language?

Yes ☐

No ☐

3-If No, what are the main reasons?

…….

…….

…….

4-Do you think having enough vocabulary is necessary to be fluent in English?

Yes ☐

No ☐

5- What method do you frequently use to teach vocabulary?

Translation ☐

Synonyms ☐

Definitions ☐

Memorization ☐

Games ☐

6- What do you think about the games-based-learning approach for teaching vocabulary?

…….

…….

…….

7- How often do you apply games in the classroom?

Always ☐

Often ☐

Rarely ☐

Never ☐

8-What kind of games do you use to teach vocabulary?

…….

…….

…….

9-Do you think games are competent in reinforcing words in learners' memory?

…….

…….

…….

10- Have you personalized games before? How? explain.

…….

…….

…….

11- Were learners' needs satisfied when using personalized games?

…….

…….

…….

12- Was vocabulary learning effective when using personalized games?

…….

…….

…….

13-Have you noticed any psychological or behavioural changes in learners when using personalized games?

Yes ☐

No ☐

14- If yes, explain these changes.

…….

…….

…….

15- How were learners' reactions and attitudes when taking part in personalized games?

…….

…….

…….

16- Did learners perform better in vocabulary tests after using personalized games?

Yes, they performed better ☐

No, they did not perform better ☐

17- If yes, explain this improvement.

…….

…….

…….

17- Were personalized games effective in engaging all the different learners?

Yes ☐

No ☐

19- Was the application of personalized games easy? If yes, what techniques have you used to make it easy?

…….

…….

…….

20- What kind of difficulties you have faced when applying personalized games?

…….

…….

…….

21- Do you think that games are a waste of time? Why?

…….

…….

22- According to you, what are PGBL disadvantages?

…….

…….

23- What kind of improvement have you noticed when applying PGBL in comparison with the traditional way of teaching?

…….

…….

24- On a scale of 1 to 10, how satisfied were you with the PGBL approach?

…….

…….

Appendix (2): Students' questionnaire

Educational games are games used by the teacher in the classroom to learn new things like vocabulary.

1- What problems do you face when learning English vocabulary? ما هي المشاكل التي تواجهها عند تعلم مفردات اللغة الإنجليزية؟

-Difficulty in memorization صعوبة في الحفظ ☐

-There are too many synonyms هناك الكثير من المرادفات ☐

-The number of vocabulary to learn عدد المفردات التي يجب تعلمها ☐

-The lack of concrete examples عدم وجود أمثلة ملموسة ☐

-Other... ☐

2- What techniques do you use to learn new vocabulary? ما التقنيات التي تستخدمها لتعلم مفردات جديدة؟

-Repetition until memorization التكرار حتى لحفظ ☐

-The use of dictionaries استخدام القواميس ☐

-Draw a picture ارسم صورة ☐

-The use of a notebook of words استخدام دفتر كلمات ☐

-play vocabulary games لعب ألعاب المفردات ☐

3- What methods do you prefer the most? ما هي الطرق التي تفضلها أكثر؟

-Translation الترجمة ☐

-Definition تعريف ☐

-Synonyms المرادفات ☐

-Games ألعاب ☐

-Other... ☐

4-What do you think about educational games? ما رأيك في الألعاب التعليمية؟

……

……

4- Have you ever used games to learn English vocabulary? هل سبق لك استخدام الألعاب لتعلم مفردات اللغة الإنجليزية؟

Yes ☐

No ☐

5- If yes, How was the experience? إذا كانت الإجابة نعم ، كيف كانت التجربة؟

-Good, I learned a lot ☐

-Bad, it was a waste of time ☐

-Other... ☐

6- Did you memorize vocabulary for a longer period when using educational games? هل تذكرت بالمفردات لفترة أطول عند استخدام الألعاب التعليمية؟

Yes ☐

No ☐

7- When using games to learn vocabulary, did you feel that: عند استخدام الألعاب لتعلم المفردات ، هل شعرت بما يلي:

-You are learning something أنك تتعلم شيئًا ☐

-You are just having fun أنك تستمتع فقط ☐

-Both كلاهما ☐

8- Did you feel that games appeased your anxiety and increase your motivation? هل شعرت أن الألعاب خففت من قلقك وزادت من تحفيزك؟

Yes نعم ☐

No لا ☐

9- If yes, explain how. إذا كانت الإجابة بنعم ، اشرح كيف.

…….

…….

10- How did you feel when you participate in educational games? ما هو شعورك عندما شاركت في الألعاب التعليمية؟

-comfortable مريح ☐

-satisfied راض ☐

-confused مشوش ☐

-uncomfortable غير مريح ☐

-unsatisfied غير راض ☐

-Other... ☐

12- How did you feel when playing educational games in comparison with the traditional way of learning? كيف كان شعورك عند لعب الألعاب التعليمية مقارنة بالطريقة التقليدية للتعلم؟

-more enjoyable أكثر متعة ☐

-less enjoyable أقل متعة ☐

-I learned more vocabulary تعلمت المزيد من المفردات ☐

-I learned less vocabulary تعلمت أقل من المفردات ☐

-I was more satisfied with the results كنت راضيا أكثر عن النتائج ☐

-I was less satisfied with the results كنت أقل رضى عن النتائج ☐

-Other... ☐

Appendix (3): Psychologist's interview

1-What effect do educational games have on students' learning and specifically vocabulary learning?

…….

…….

2-Do educational games have an impact on students' psychology (emotions, stress, anxiety, etc)?

…….

…….

3-Explain from a psychological perspective how educational games affect learners' psychology.

…….

…….

4-Do educational games decrease negative emotions and positive emotions? How?

…….

…….

5-How do educational games impact learners' motivation?

…….

…….

6-How do educational games impact learners' attention?

…….

…….

7-According to you, are there learners with ADHD in each classroom?

…….

…….

8-How do educational games impact learners with ADHD?

…….

…….

9-What do you think about content personalization to meet students' needs?

…….

…….

10-Does content personalization have a benefit on learning?

…….

…….

Appendix (4): Games that were planned to have in the experiment

The secret box

The teacher writes words in small papers and puts it in a box. Then, the teacher divides learners into groups, in each group one person will come to the board and choose a paper from the secret box. The learner has to communicate what is in the paper to his team members: he can act it out, use verbal explanations, or gestures. The student has to explain the word in any way possible in 3 minutes without saying the word. The group has to guess what is written in the paper. It is greatly enjoyed by kinesthetic learners.

Match it with a pic

The teacher has to bring pictures or stickers that reflect a vocabulary word (adjective, noun, verb). After explaining all the target vocabulary (maximum 6 words), the teacher writes all the vocabulary on the board leaving space between each word. Then, the teacher Invites learners to come to the board and stick each picture/sticker with the appropriate vocabulary. In the first round, learners have to stick all the stickers in 30 sec to win. The second round, they have to stick all the stickers within 15 sec to win the games. The learners will compete with time, and the winners will have a point. This game strengthens concentration and memory. Besides, it is beneficial for visual and kinesthetic learners.

Labelling game

The teacher will bring pictures, videos or recording tips that explain some vocabulary words. Learners have to take their time to watch or listen carefully to the materials to guess the appropriate vocabulary. This game accommodates visual and auditory learners' needs and interests.

Role-playing

Learners have to watch a video or read a text about a specific topic. Then, the teacher will ask them to act it out using different vocabulary than the one mentioned in the source (synonyms and antonyms). The role they have to play should be reflected in real life. This game is more useful for visual, auditory, linguistic and kinesthetic learners as it requires listening, watching and moving.