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INCIDENTAL LEARNING OF ENGLISH VOCABULARY THROUGH ONLINE COMPUTER GAMES: A RESEARCH STUDY WITH PALESTINIAN ELEMENTARY STUDENTS

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DEDICATION

إلى من منحني كل ما يملكون...

منحوني حبهم، وقتهم وحتى قوتهم لأكون ما أنا عليه اليوم..
إلى من دفعني إلى الأمام في لحظات يأسي...
إلى من دائما يخبرني أن لا أخاف شيئا...
إلى من دعمني في طريقي وأعطاني الشغف لأحقق حلمي...
إلى معلميني الأوائل اللذين علموني أن التعليم هو سلاح كل فلسطيني...
إلى والدي الأعزاء: وليد ولبنى.
فأنتم من تنيرون الظلمه.
وأنتم من يستحق أن يهدى هذا العمل له، فهذا إنجازكم أنتم لا أنا.

كما وأهدي عملي:

إلى أختي العزيزة عزة، أيام أفضل سوف تأتي فأنا أؤمن بك.

إلى إخوتي الأعزاء، خالد، كرم ومجد، سوف تكونون ما تريدون، ما عليكم سوى العمل بجد.

إلى عمتي الغالية باسمة، شكرا على حبك.

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Abstract

This dissertation study was motivated by an interest in investigating how students acquire English vocabulary with online computer games. This study aims to explore the influence of using online computer games in learning English vocabulary, and to find whether there is any relationship between playing online computer games and acquiring vocabulary for Palestinian elementary students. Also, this study aims to examine teachers' opinions toward using online computer games in learning English vocabulary.

This is a descriptive analytical research that uses quantitative methods: an experiment with students and a questionnaire for teachers. This study was conducted with third grade Palestinian students in the Salfit district. The sample consisted of 91 students over four groups. Two experimental groups (males and females) and two control groups (males and females). In the female groups the number of students was the same (19); whereas, the number of males were different in each group. The male control group consisted of 27 students and the experimental group 26.

In order to study the effects of online computer games on students' vocabulary learning, the experimental group which consisted of two groups (males and females) learnt with online computer games that the researcher had chosen for them. This was done accurately after studying the *English for Palestine* curriculum from the first to the third grades and collecting the words that learners should know and will study in the third grade, and those words were classified into topics. Online computer games were collected to cover the topics (animals, clothes, fruits, vegetables, food, transportation, jobs, body parts, colors and numbers). A website was designed to store the games on as it is difficult for students to move from one game to another on different websites.

This experiment lasted for three months, twice a week and 45 minutes per session for each group. Vocabulary achievement tests (pre- and post- tests) were applied to test students' vocabulary before and after the experiment. The two groups learnt differently, the control group used the traditional way of learning in which students study English words and their Arabic meanings whereas the experimental group learnt English vocabulary with online computer games.

A questionnaire for elementary teachers was also used to collect data from teachers about using online computer games in learning vocabulary. 126 Palestinian English foreign language teachers participated in answering the questionnaire which consisted of 33 items and was divided into 3 sections.

The results showed that Palestinian English as a foreign language teacher do have a positive opinion toward using online computer games in learning English vocabulary even if they do not use them in their classrooms. They agreed that this tool motivates students to learn, attracts their attention, stimulates interest, fosters students' self-learning and encourages cooperation. Moreover, most of the teachers agreed that this helps students to remember new words easily, encourages them to recall vocabulary, improves students' ability to

learn English vocabulary effectively, increases students' productivity in vocabulary, increases their ability to use and learn vocabulary, and it connects students with learning vocabulary at home. Also, online computer games help teachers to overcome some learning problems such as slow learning, shy students and weakness in vocabulary.

The findings for the experimental method and the pre- and post-test that were used to investigate students' learning showed that learners who learn with online computer games (the experimental group) learn vocabulary better than students who learn in the traditional way (the control group). Also, low and high achievers in the experimental group got better results in the post- test than their counterparts in the control group, but the significant differences were for the high achievers in general. Thus, comparison was made between the high achievers in the control and experimental groups. It was indicated that the high achievers in the experimental group were more accomplished in learning vocabulary.

When learning vocabulary was compared with regards to gender, the findings showed that female students outperformed male students in learning English vocabulary overall. However, a comparison was made to investigate which female group (experimental or control groups) learn better. The results presented that girls in the experimental group had learnt more vocabulary than the other group. Finally, the last findings explore whither the same way of teaching affects students with different genders similarly or not. It was found that female and male students in the experimental group and female and male learners in the control group learn English vocabulary equally. This showed that online computer games can be a very promising tool in learning English vocabulary since it is appropriate for all students regardless of gender.

Keywords: Language Acquisition, English Vocabulary Learning, Gamification, Palestinian students, English Language Learning, Incidental Learning,

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List of abbreviations

AT Activity Theory
EFL English as a foreign language
EFLT English foreign language teacher
EGP English for general purposes
ELT English language teaching
ESA The Entertainment Software Association
ESL English as a second language
EVS English vocabulary size
FLL Foreign language learning
FLLs Foreign language learners
ICT Information communication technology
L1 Native language
L2 Second language
LLSs Language learning strategies
LTM Long term memory
M Mean
MDA Mechanics, Dynamics and Aesthetics
MMOs Massive multiplayer online games
MMOGs Massively multiplayer online games
MMORPG Massive Multiplayer Online Role-Playing Game
MoE Ministry of Education
MoHE Ministry of Higher Education
MUDs Multi-user domains
OCGs   Online computer games
PCBS Palestinian Central Bureau of Statistics
PVL Process of vocabulary learning
QCERD Qattan Center for Educational Research and Development
SD Standard deviation
 SILL Strategy inventory of language learning
 SLA Second language acquisition
SPSS Statistical package for the social sciences
S2R   Self-Regulation
VAK Visual, auditor and kinaesthetic
VARK Visual, auditory, kinaesthetic and read/write learning
VLS   Vocabulary learning strategies
WoW World of Warcraft
WTC Willingness to communicate
ZPD Zone of proximal development

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Operational definition of terms

Following are definitions of relevant terms which are necessary for this study.

Digital Game-based learning: "[T]he design and use of a diverse array of digital games for the purpose of learning or teaching a second or foreign language (L2)" (Cornillie, Thorne & Desmet, 2012, p. 2)

Elementary students (6-12) years old: Students who are in elementary schools and they are from the 1st grade till the 6th grade (JET, 2013)

Gamification: It is "the process of game-thinking and game mechanics to engage users and solve problems" (Zichermann & Cunningham, 2011, p. xiv). Also., Werbach and Hunter (2012, p. 16) stated that gamification "is the use of game elements and game-design techniques in non-game contexts."

High achievers: Students whose total score in the achievement test in English language lies above 50% of the test score.

Incidental learning: It is said to be learning that happen unintentionally without planning to learn or to analyze language, and this may include implicit learning (Kerka, 2000).

Learning Strategies: "[S]pecific actions, behaviors, steps, or techniques - such as seeking interlocutors, or giving to yourself the incentive to deal with a difficult language task - used by students to enhance their own learning" (Scarcella and Oxford, 1992, p. 63). Moreover, O'Malley and Chamot (1990, p. 1) defined it as "special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information".

Low achievers: Students whose total score in the achievement test in English language lies less than 50% of the exam score.

Massive multiplayer online role-playing game: "[I]mmersive, graphically rich 3D environments in which many players from geographically distinct locations can navigate the game space and interact via digital characters known as avatars, thus offering the opportunity for a great deal of informal, contextualized interaction in a learner's target language, including interaction with native speakers" (Rama, Black, Van Es & Warschauer, 2012, p. 323)

Online Computer games: They are games, people from different ages play them by using computers and they are connected with the internet to be online, without internet connection they will not work. Wang and Zhu (2011) stated that online game generates activity that is played over some form of connection or computer network.

Third graders: They are the pupils who are enrolled at the 3rd grade at the elementary schools in Palestine. They are between eight and nine years of age.

CHAPTER I

BACKGROUND OF THE STUDY

1. Introduction

In order to learn any language, learners should acquire its vocabulary, grammar, pronunciation and its four skills: listening, reading, speaking and writing. However, vocabulary is considered to be the core of all languages as it is the essence of the language itself (Laufer, 1997). According to Thornbury (2002), developing vocabulary is the most important factor for learning the English language as people can be understood if grammatical errors are made but they cannot if they have a lack of vocabulary. As indicated by Blachowicz and Fisher, (2004, p. 66) that "People often consider a strong vocabulary the hallmark of an educated person".

Neither language production nor language comprehension would be possible without some knowledge of vocabulary (Mukoroli, 2011; Richards, & Renandya, 2002). Nation (2001) noted that vocabulary knowledge and language usage complete each other. If one has vocabulary, the language can be used and this leads to gaining more vocabulary and improving one's language. Furthermore, many researchers such as Gu (2003), Laufer and Nation (1999) and Nation (2001) stated that success in learning and using the English language as a second or a foreign language depends on vocabulary acquisition. Vocabulary is vital for learning reading, listening, writing and speaking English, and without it, learners cannot use the four language skills.

Despite the importance of learning vocabulary and the agreement that without vocabulary there is no communication, it is often neglected in language learning and teaching. Some teachers believe that there is no need to teach vocabulary and that it can take care of itself (Nation, 1990). Similarly, Al-Darayseh (2014) stated that not only do EFL teachers neglect vocabulary, but also the curriculum designers do not pay attention to it either. Besides, EFL teachers in most Arabic countries apply the traditional way of teaching in which students listen, try to find a new word's meaning and memorize the words and their translation in Arabic. So, students in Middle Eastern countries such as Palestine find difficulties in learning vocabulary and using it. They consider learning English vocabulary to be the most complex task and this leads to weakness in all language skills. Moreover,

Sorour (2009), and Sweeny and Mason (2011) have highlighted that helping low achievers in learning vocabulary leads to academic success, and if students learn vocabulary correctly, they will excel in the four skills (Nation, 1990).

According to Thornbury (2002), vocabulary retention is the main factor in learning language. It has been shown that using new methods and strategies in teaching English to make students part of the learning process and to engage them in learning by being active, are of great importance. This can occur when the teaching methods focus on students (learners-centered approach), and they try to create an enjoyable climate which motivates students to learn, memorize and recall what they have learned. Some of these strategies are; games, songs, drawing and playing (Hismanoglu, 2000; McCombs, & Whistler, 1997). Students' achievement is affected by these strategies and the procedures that teachers use (Bernaus, Wilson, & Gardner, 2009). Similarly, Huyen, & Nga (2003) and Uberman (1998) claimed that students want to use new strategies instead of the traditional ways of learning as they feel bored and tired of the old one. Nevertheless, there is no doubt that students should practice what they learn or it will be forgotten. As Nation (2001, p. 69) mentioned:

> A word may be noticed and its meaning comprehended in the textual input to the task, through teacher explanation or dictionary use. If that word is subsequently retrieved during the task then the memory of that word will be strengthened.

Teaching English vocabulary to children is not an easy task because they are active and curious to know everything (Slattery, 2001). Harmer (2001) added that they have a short attention span, at the same time, they have a clear mind and they can learn the language quickly but this can only happen by attracting their attention with engaging activities. In addition, Wadsworth (2003) believed that children aged between seven and ten are interested in learning new words and they can memorize them quickly, but they can also forget them easily. In order to solve this problem learners should take control of and responsibility for their learning which will motivate them to learn vocabulary (Nation, 2003).

Al-Laqani (1994) and Cakir (2004) expressed that students' learning is affected by three factors: first of all, teachers' actions which could have an impact on the learners' approach towards learning. The second is the teaching strategies that teachers use which should focus on attracting students' attention, Finally, class atmosphere which motivates

students and stimulates their imagination and creativity through activities to learn better. These three factors can be achieved by playing games as Ang and Zaphiris discussed "game playing is a vital educational function for any creature capable of learning" (2006, p. 2). Indeed, games are an appropriate tool for children to learn languages as confirmed by Zdybiewska (1994, p. 6), "games are a good way of practicing language as they provide a model of what learners will use the language for in real life".

Many significant changes have occurred since the birth of new technology and the appearance of the net generation (a term which has been used for people born after 1980s and who are unaware of life before technology and the Internet (Leathem, & Tatum, 2012). They are affected by the net and technology in their lives, they use electronic media to play, communicate and even to learn (Oblinger, & Oblinger, 2005). Moreover, Moore (in Prensky, 2001b, p. 46) said that "For adults computer skills are a tool, but for teenagers using computers has become a second language". In addition, those students are multi- taskers; they can read, listen to music and message their friends, all at the same time (Howe, & Strauss, 2003). They seek to learn by actions, which means that they want to apply the information that they have learnt immediately since experience leads to learning (Baker, Parasuraman, Grewal, & Voss, 2002; Brown, 2000). This has changed the games from traditional to those which are played with technology. Regarding these, researchers use a variety of terms to refer to this type: e.g. digital games (Prensky, 2001b), video games (Gee, 2007), and computer games (Begg, Dewhurst, & Macleod, 2005). However, when games are connected to the Internet, they are known as online computer games (see Abrams, & Walsh, 2014; Ellis, Kirriemuir, Krotoski, McFarlane, & Heppell, 2006), and if the game is online and is played by many players it is called a massive multiplayer role playing online computer game (MMORPGs) (Kim, Kim, Shim, Im, & Shon, 2013; Yee, 2006), which can also be considered a good learning tool.

It is said that today's students play online games a great deal and 60% of college students are regular players (Oblinger, & Hanger, 2005) and 75% of children play games daily (Kirriemuir, & McFarlane, 2004). These gamers are impatient and capable of multitasking and the time they spend daily playing video games amounts to a number of hours. (Carlson,

2005; Prensky, 2001b). They are connected, engaged, participative, mobile and flexible and also visual (Deblois, & Oblinger, 2007). They are very active and want to do everything by themselves. Besides, they like to work in groups and to learn in an interactive and engaging classroom (Howe, & Strauss, 2003). So, they don't like learning in the traditional way because it depends on memorizing and repeating the words. Also, they consider these ways old fashioned, uninteresting and they do not fuel their curiosity (Yip, & Kwan, 2006). Wood (2001) added that games attract student's attention more than textbooks. In short, in teaching the net generation, teachers should increase students' interaction in the classroom (Ciocco, & Holtzmann, 2008). If they do not, students will not be engaged in the learning process and they may use the Internet as an alternative to classroom learning (Deblois, & Oblinger, 2007), or they may not attend classes (Oblinger, & Oblinger, 2005). So, online computer games should be used to encourage students to learn and interact with each other as Sundqvist and Sylvén (2012, p. 189) said that "Learning languages is a social activity – and so is playing computer games".

All of these factors have helped create new ways of learning that draw upon students' abilities in game playing to facilitate their learning. Two terms related to digital games and education have appeared: Digital Game-Based Learning (DGBL) and Digital Game-enhanced Learning in learning foreign languages. Both focus on using games as a tool in education in order to help students learn better (Reinhardt, & Sykes, 2012). The first is designed to teach specific things (Sykes, 2010). Whereas, the second uses vernacular games that provide students with learning opportunities during play (Piiranen- Marsh, & Tainio, 2009). Many researchers in recent times have studied the use of video games in learning foreign or second languages (see Cornillie, Thorne, & Desmet, 2012; deHaan, 2011; Neville, Shelton, & McInnis, 2009; Peterson, 2010a, 2010b, 2012; Piiranen- Marsh, & Tainio, 2009; Prensky, 2001a, 2001b; Reinders, 2012; Sykes, & Reinhardt, 2013; Thorne, 2008, for example). Most of them focused on Game-based Learning such as (Prensky, 2001b; Reinhardt, & Sykes, 2012).

According to Godwin- Jones (2005), online games are one of the most important tools in language learning since they give students the chance to understand what they are learning

because they learn by doing and learners are given a choice of games which may interest them. In addition, online computer games provide information in different ways; sound, video, pictures and text. which fosters students' learning as they have different learning styles (Deblois, & Oblinger, 2007). Online computer games help students to learn vocabulary as they display information with interesting way. Also, students can access the Internet and choose the online game that they like without hesitation. Uberman (1998, p. 23) stated that "games encourage, entertain, teach and promote fluency. If not for any of these reasons, they should be used to help students see beauty in foreign languages, not just problems that at times seem overwhelming". Additionally, a number of researchers like Gonzales and Izquierdo (2012), Perrotta, Featherstone, Aston & Houghton (2013), Yip and Kwan (2006), and Zheng, Bischoff, & Gilliland (2015) focused on the positive effects of online computer games on students' learning such as creative thinking, strategic thinking, motivation to learn, attracting their attention and helping them learn effectively and quickly.

Furthermore, some other researchers like Ashraf, Motlagh, & Salami (2014), Kalyuga, Mantai & Marrone (2013), Markopoulos, Dossis, Fragkou, & Kasidiaris (2016), Peterson (2012a), and Vidlund (2015) focused on the influence of using online computer games on learning vocabulary in particular. Kalyuga et al. (2013) found that games are one of the best ways to remember the new words that students have to memorize and apply what students learn in their real lives They also help students to learn the words' pronunciation and spelling. Similarly, Väisänen (2018) concluded that video games foster students' communication skills by using the language. Moreover, Qteefan (2012) admitted that educational computer games create an appropriate environment for learning English as a foreign language as they increase students' achievement and motivation, also they encourage students to participate in the learning process". However, as games attract students' attention, they attract researchers' attention to study games and their role in education (Ang, & Zaphiris, 2008).

In light of what preceded, previous studies suggested a new strategy to help learners to learn English vocabulary easily by using online computer games since this way provides "experimentation in a safe virtual environment" (Kirriemuir, 2003, p. 7) and they "Inspire students to learn in lifewide, lifelong and lifedeep ways" (Lee, & Hammer, 2011, p.4).

However, many researchers claimed that there is a need for more research to confirm whether digital games are for learning or for playing, whether it is a school or home task, multitasking or disengagement (Ito, 2009; Thomas, 2011). Studies have also been conducted to discover how technology can be used in language learning (Macaro**,** Handley, & Walter, 2012).

This study clarifies the difference between Digital Game-based Learning and Digital Game-enhanced Learning as a tool for teaching and learning English vocabulary. In this study, Online Computer Game- based Learning was used in teaching the *English for Palestine* curriculum since the main purpose was to investigate the influence of using online computer games in learning English vocabulary for elementary students in Palestine.

1.1. What is vocabulary?

The meaning of vocabulary has developed overtime but the main ideas for the different definitions focus on three main aspects:

1) **Vocabulary is a set of words and their meanings:** Burns (1972) viewed vocabulary as a group of words used by a person, class or profession. Similarly, Procter (1996, pp. 1628–678, as cited in Easterbrook, 2013, P.11) defined it as "all the words used by a particular person or all the words which exist in a particular language or subject". Then, McWhorter (1989, p.311) said that vocabulary means the ability to recognize individual words and to associate meaning with the particular combination of letters that form a word. Miller (1999) explained that vocabulary is a set of words that are the basic building blocks used in the generation and understanding of sentences. Similarly, Hatch and Brown (1995, p. 1) found that "vocabulary is a list or set of words for a particular language or a list or set of words that individual speakers of a language might use". A similar definition was given by Diamond and Gutlohn (2006), and Hornby (1995) who stated that vocabulary is the knowledge of words and word meanings.

2) **Vocabulary is more than words and their meanings:** Some changes appeared in the definition of Ur (1998, p. 60) who spoke about vocabulary as words teachers teach in the foreign language. Vocabulary may be more than a word; it could be two or three words but they show one idea. So, as he discussed that the word "items" should

be used instead of "words" to refer to vocabulary. Changes continued to be presented in the meaning of the word "vocabulary", Stahl (2005) showed that vocabulary is the knowledge of a word which not only implies a definition, but also implies how that word fits into the world. Young (2007) claimed that vocabulary is the study of the word's meaning, type, roots, phonetics and phonology, how it is used and its analogies. Moreover, Nugroho (2007) clarified that vocabulary is not only the knowledge of words and word meanings but also oral and print productive and receptive forms. It could also refer to the words that students need to know or must know before being able to complete a task. In addition, according to Nation (2001, pp. 22–23), word meaning also "consists of the relationship between a word and its referent (the person, thing, action, condition, or case it refers to in the real or an imagined world)". However, Adger (2002), and Taylor (1990) stated that vocabulary is not only confined to the meaning of words but also includes how vocabulary in a language is structured: how people learn words and how they use them and the relationship between words, phrases, categories of words and phrases. Saputra (2007) added that vocabulary is every word that is used in a language, have meanings and consist of parts like verbs, idioms, pronunciation.

3) **Vocabulary means communication:** Adams and Collins (1977) clarified that words are the basis of communication. When learners know a great number of words they can improve all areas of communication: speaking, listening, reading and writing. According to Kamil and Hiebert (2007), vocabulary can be classified as receptive (words we understand when others use them) or productive (words we use ourselves). Vocabulary can also be classified as oral or written. Thus, each of us has four kinds of vocabulary: words we understand when we hear them (receptive/oral), words we can read (receptive/written), words we use in our speech (productive/oral), and words we use in our writing (productive/written). This also agreed with the definition by Neuman and Dwyer (2009, p. 385) who defined vocabulary as "words we must know to communicate effectively; words in speaking (expressive vocabulary) and words in listening (receptive vocabulary)". As concluded in Alqahtani's (2015, p. 25) study,

vocabulary is "the total number of words that are needed to communicate ideas and express the speakers' meaning".

1.2. Why is vocabulary important?

There are different aspects that make vocabulary very important in language learning. First of all, vocabulary is the heart of any language and without it learning a foreign language would not be possible (Alqahtani, 2015; Zhang, Lin, Zhang, & Choi, 2017) as claimed by Lewis (1993, p. 89), "lexis is the core or heart of language". According to Carter (2001) the first step for learning new language is vocabulary. Besides, learners will not have the ability to read, understand, speak or write in the foreign language (Rubin, & Thompson, 1994). Joklová (2009) showed that without vocabulary language could neither exist nor could words carrying meaning. Moreover, the most important thing in learning any language is to understand and express the meaning of the words.

In a summary, vocabulary is what makes successful communication occur in L1 and L2 and L2 learners have realized the importance of vocabulary through their own learning experiences. As claimed by Neumann and Dwyer (2009, p. 385), the importance of vocabulary can be defined as "the words we must know to communicate effectively: words in speaking (expressive vocabulary) and words in listening (receptive vocabulary)". It can be noted that "learners carry around dictionaries and not grammar books" (Schmitt, 2010, p. 4). English has been reported to involve a large number of words ranging from 400,000 to 600,000 (Claiborne, 1983) and most of these words are learned incidentally rather than in a formal study situation (Schmitt, 2000).

The second reason that vocabulary is one of the most important elements in language learning is the difficulty that learners face in learning a foreign or second language. Students could not excel in vocabulary by memorization only. They also need to use it in real contexts (Nation, 1990).

Comparing vocabulary with grammar has shown the priority of vocabulary, and this is the third reason which makes vocabulary beneficial to study. The studies of Harmer (1991), McCarthy (1990) and Wilkins (1972) confirmed that vocabulary is more important than

grammar, learners can convey a little without grammar but without vocabulary learners can convey nothing. According to Harmer (1993, p. 153), "if language structures make up the skeleton of language, then it is vocabulary that provides the vital organs and the flesh". Above all, it is said that vocabulary is "an essential part of mastering a second language" (Schmitt, 2008, p. 329). Also, learners care more about learning vocabulary than grammar, "learners carry around dictionaries and not grammar books" (Schmitt, 2010, p. 4).

The fourth reason that vocabulary is important is "vocabulary acquisition" This is very complex because when students learn words, they should learn everything about them: their meanings, how to pronounce them, how to spell them, when to use them (Kalyuga, et al., 2013; Kiliçkaya, & Krajka, 2010). Nation (2001) added that knowing a word means knowing its three aspects: the form, the meaning and how it is used.

Knowing the form of a word is knowing the spelling, sound and word parts. Knowing the meaning of a word is linking its form and meaning. Knowing the concept of a word is knowing what it can refer to and knowing what other words of related meaning it can be associated with. Finally, knowing how a word is used is the grammar of the word including parts of speech and sentence patterns it fits into, collocates of the words and whether the word is formal or informal, polite or rude, used mainly by children and so on, or if has no restrictions on its use (Nation, 2001).

In addition, vocabulary knowledge can be divided into depth and breadth (Qian, 1999). Depth of vocabulary includes pronunciation, stylistics features, spelling, antonymy, synonymy, hyponymy and collocational meaning (Nation, 1990; Read, 2000; Richards, 1976). These are interconnected structurally and functionally (Qian, 1999). On the other hand, breadth of vocabulary refers to the number of words that learners have in their knowledge completely or partially (Nation, 2001). According to Chapelle (1998), the definition of vocabulary should contain four elements: knowledge of word properties, vocabulary size, processes of lexical access, and lexicon organization (Chapelle, 1998). However, Henriksen (1999) mentioned three vocabulary aspects: a depth of knowledge, a receptive-productive knowledge and a partial-precise knowledge. Qian (2002) added four

dimensions for vocabulary: vocabulary size, lexical organization, depth of vocabulary knowledge, and automaticity of receptive–productive knowledge.

The last reason for the importance of vocabulary is that learners who are successful in vocabulary are more able to achieve academic success (Sweeny & Mason, 2011). Adolphs and Schmitt (2003) claimed that to understand a text or to communicate, students should know more than 2,000-word families. Similarly, Sedita (2005) argued that vocabulary knowledge is very important for reading comprehension as it reflects how students will assimilate the text. In addition, Hirsch (2003, p. 16), goes further by saying that "Vocabulary experts agree that adequate reading comprehension depends on a person already knowing between 90 and 95 percent of the words in a text". Nation (2006) in his study agreed that learners who learn foreign languages should know around 8,000-word families to do well in this language. However, it was said that slow learners have problem in improving or learning vocabulary, they will be less able than their classmates to comprehend a text (August, Carlo, Dressler, & Snow, 2005). Vocabulary size shows one's mental age, and the development of vocabulary measures a person's intelligence (Langer, 1967, p. 157). The truth is that students gain a good position in their school if they have a rich vocabulary as they can understand their teachers and the text books better than others. Moreover, vocabulary size is a good indicator for general competence. Even if students all have the same size vocabulary, they have different understanding and knowledge (Duncan et al., 2007; Kaplan, & Saccuzzo, 2013).

1.3. How do young learners learn English Vocabulary?

According to McLaren and Madrid (1996), it is more significant when teaching young learners a foreign language to decide which words to teach and teachers should present those words in a familiar context for students. Also, the researchers showed that young learners learn vocabulary quickly but they also forget it quickly so teachers should use games, toys and entertainment to help them recall words. This supports an idea by Ellis and Brewster (1991) who pointed out that using different strategies to introduce the new words such as objects, drawing, pictures, and games is very helpful in learning vocabulary. However,

McLaren and Madrid (1996) remarked that teachers should use students' senses: hearing, sight, taste, touch, and smell to help them memorize and use the new words.

Harmer (2001, p. 82) mentioned that students at elementary level have the following characteristics:

    a. If they don't understand the words they try to respond to the meaning.

    b. They prefer to learn indirectly.

    c. They understand what they hear and see besides the explanation and they like abstract material.

    d. They have great ambition and enthusiasm about what they are learning

    e. They need individual attention and care from their teacher.

    f. They learn better when they are talking about themselves and their lives and respond very well.

    g. They get bored very quickly because they have a limited attention span and they like to be engaged in the class.

Also, Abo Ja'far (2014) and Zahran (1986) clarified that learners between 8-9 years old are in the middle childhood stage; they have the ability to learn reading and writing; they are active and they like learning by doing and playing; they use clear and specific vocabulary in conversation and discussions; spell simple words correctly, correct most spelling independently or with a dictionary for help.

Moreover, Saleem (2002) agreed that learners at this age have the ability to learn a large quantity of vocabulary and use it. They like to learn competitively and enjoy group work activities. With this in mind, psychologists consider the stage between childhood and adulthood as the most appropriate age for acquiring vocabulary.

Harmer (2010) and Zahran (1986) pointed out that learners in this age have the ability to memorize a great number of words and they focus their attention in the class on their teacher and on the activities that the teacher does so they can learn effectively and quickly. However, girls at this age are better learners than boys because there are psychological, intellectual and linguistic differences between males and females so teachers should help students to be active learners and learn by themselves to learn effectively (Harmer, 2010).

According to Awwad (1997), Ghazal (2012), and Zahran (1986), elementary school students can acquire vocabulary easily since they have the ability to differentiate between similar words and their different meanings. Also, they are capable of finding synonyms and antonyms for new words. Moreover, these students can put the words in a variety of sentences and can write long sentences to create stories.

Based on the points stated by Abo Ja'far (2014), Awwad (1997), Ghazal (2012), Harmer (2001), Saleem (2002), and Zahran (1986), it's clear that elementary school students, particularly those aged between eight and nine are very enthusiastic, understanding, and curious to learn. But they get bored quickly so the best way to attract their attention is to teach them with techniques that they like and that they already know. This could be through online computer games because in this way students can see, hear, read, and speak so they can retain information effectively.

1.4. Justification

This study has been deemed necessary as learning the English language for Palestinian students is considered a very difficult task (Sorour, 2009). Many researches showed that young children have the ability to learn a great number of words and learn the language easily when they are active and they are taking action in their learning (Cameron, 2001). The researchers observed that Palestinian students memorize new words and after a while they forget them. However, the words that they learn while playing computer games are retained in their memory and they use them in their lives for example 'game over', 'ready', 'stop', 'get out', 'fire' or 'shoot'.

Moreover, it is argued that education today is suffering great challenges from all sides. From social, economic and cultural challenges to over-population, over-knowledge, education philosophy development, the change of the teacher's role, the spread of illiteracy, a lack of the staff & technological development & mass media (Aloraini, 2005, pp. 30–32)

Young learners are digital natives and students consider computer games as something natural that they take for granted. The new generation prefers everything related to technology (Prensky, 2001b). This drives teachers to use online games to attract students' attention and to help them to learn English vocabulary quickly since they mean that students

hear, see, speak and write at the same time and these are the best ways to teach. According to Gee (2007), video games are very important in learning languages as they engage students to practice what they learn and they give students the chance to choose their level during play.

Thomas (2012) argued that (DGBLL) studies have been undertaken in a classroom or laboratory and very few of them focus on the incorporation of video games with the curriculum. The current study uses online computer game- based learning in teaching the *English for Palestine* curriculum so it has been conducted to fill the gap in the lack of the experimental studies that are being conducted in the field of learning English vocabulary by using online computer games and their influence on elementary students in Palestine. Many researchers such as (Peterson, 2010a) recommended more studies to investigate learning outcomes after using digital games and how they may be used in classroom.

1.5. Research Questions

The overall problem of the study can be stated in the following main question: *What is the influence of using online computer games on learning English vocabulary for elementary students in Palestine?* The problem can be more explicitly posed in the following related questions:

RQ1: Does the use of online computer's games have a positive influence on learning English vocabulary from the teachers' perspective?

RQ2: Are there significant differences in the means on the achievement level between the students who learn English language through online computer games (the experimental group) and those who learn English language through the traditional method (the control group)?

RQ3: Are there significant differences in the means on the achievement level between the high achievers and low achievers in the experimental group and their counterparts in the control group?

RQ4: Are there significant differences in the means on the achievement level between the experimental group and the control group due to gender?

1.6. Research Hypotheses

HYP. 1: The researcher hypothesizes that learners in the control and experimental groups will get similar marks in the pre-test.

HYP. 2: The researcher hypothesizes that the achievement level will be better for the students who learn English vocabulary through online computer games (experimental groups) than those who learn English vocabulary through the traditional method (control groups).

HYP. 3: The researcher hypothesizes that the low achiever learners who learn with online computer games (experimental groups) will learn English vocabulary better than the low achievers who learn in the traditional way (control groups).

HYP. 4: The researcher hypothesizes that in the experimental group, male students will outperform female students in the achievement test.

1.7. Objectives

The researcher divided the study objectives into the general and the specific objectives.

The General Objectives are:

1) To investigate the influence of using online computer games on learning English vocabulary for elementary students in Palestine.

2) To show the importance of using these online games to make learning English vocabulary easier for students.

The Specific Objectives are:

1) To develop third grade students' English vocabulary through the use of online computer games.

2) To discover if there are any significant differences in the learners' performance in vocabulary as a result of applying online computer games to improving students' learning of vocabulary.

3) To show elementary teachers' perspectives toward using online computer games in teaching English vocabulary.

4) To provide teachers and the Ministry of Education with recommendations and suggestions in regard to the findings about online computer games and how to use them in the classroom to teach English vocabulary.

CHAPTER II

THEORETICAL FRAMEWORK FOR ONLINE COMPUTER GAMES AND LEARNING VOCABULARY IN A FOREIGN LANGUAGE

2. Previous Studies

Chapter II is divided into two domains. The first tackles studies that examine the learning of English vocabulary and is divided into four main topics: the first being vocabulary learning in a foreign language that contains vocabulary knowledge, vocabulary retention, and why students have problems in leaning vocabulary. The second topic: strategies for learning vocabulary which consists of vocabulary learning taxonomies. The third is vocabulary learning approaches and the final topic in this section is online computer games and vocabulary approaches.

The second domain focuses on eight main topics: Information communication technology (ICT) in Education, and the role of technology in children's lives today; introduction to digital games that includes the classification of digital games, Game-enhanced learning and Game-based learning; characteristics of good video games, Games' design, multimedia and online computer games. This chapter also discusses some of the educational theories which are related to online games and the advantages of digital games in education in general and in learning English vocabulary in particular. Massive multiplayer games were studied to analyze their effects on learning English vocabulary as well as the factors that affect learning with online games such as the gender variable. And finally, the obstacles that are faced when using online computer games in schools.

2.1. Vocabulary learning in the foreign language

For many years vocabulary was considered to be less important than other language domains like grammar, pronunciation, reading and writing so there was lack of studies on the topic (Meara, 1984). However, things have changed in recent years and lots of attention is now given to vocabulary (Thornbury, 2002; Ruiz-Cecilia, 2013). And it was agreed that language acquisition depends on vocabulary acquisition (Ma, 2009, p. 21). However, many researchers (Schmitt (2010); Nation (2001); Ruiz-Cecilia, 2013; and Meara, 1995) believe that vocabulary is the most complicated aspect for learning a second or foreign language due to the immensity of the task. Schmitt (1998) argued that "The mechanics of vocabulary acquisition is one of the most intriguing puzzles in second language acquisition" (p. 281),

because the understanding of the vocabulary acquisition process in language learning is still limited.

It is worth mentioning that learning new vocabulary helps students to improve their four language skills but vocabulary depends on different factors which makes the means of obtaining it unclear (Schmitt, 2008). Weakness in vocabulary causes learning problems in reception and production of the language as McCarthy (1990) said "Vocabulary is the biggest component of any language. If you do not know enough vocabulary you will not be able to express yourself adequately." (p. 2). Moreover, for a good understanding of any language "lexis" is the most important part to study and it is connected with learning vocabulary. Learners need to know word connotations, collocations, syntax, the appropriate use of words and the different denotation of these words (Grabe, & Stoller, 1997; Kim, 2011; Tekmen, & Daloglu, 2006).

2.1.1. Vocabulary knowledge

Vocabulary is related to something called "lexical item" which refers to the form, and "mental lexicon" which means the mental dictionary (Aitchison, 1994). Singleton (1999) states that:

> [The lexicon] constitutes that component of language or knowledge of a language which has to do with what one might call 'local' phenomena - the meanings of particular elements of a given language, the phonological and orthographic forms of these elements, and the specific ways in which they collocate and colligate. (p. 15).

This shows that lexicon refers not only to the elements of the words, but it is also the relationship between words and among words. Jiang (2000, p. 48) argued that the mental lexicon gives semantic, syntactic, morphological and formal (phonological and orthographic) information about the lexical item. Gass and Selinker (2001) claimed that not only language learners but also native speakers find lexical error to be the main reason behind difficulty in communication.

It is said that the purpose of learning vocabulary is to move the lexical information to the long-term memory instead of the short-term in order to use it at any time and for it to be permanently saved (Schmitt, 2000).

It was argued that the mental lexicon of the first language is different from the mental lexicon of a second language. On the contrary, Singleton (1999) claimed that the mental lexicon in the L1 and L2 are similar and that the phonological factor affects learning vocabulary in the second language especially in the early stages.

To be clear, vocabulary knowledge means to know a word, and this can be measured through: lexical knowledge and lexical competence. Lexical knowledge as Jiang (2000) defined it is "the knowledge or information a L2 learner remembers about the form, meaning, grammatical usage and sociolinguistic use of a word that is stored in a general memory system, rather than integrated into the lexical entry of a word" (p. 65). Whereas, lexical competence means "the semantic, syntactic, morphological and formal knowledge about a word that has become an integral part of a lexical entry in the mental lexicon and can be retrieved automatically in natural communication" (Jiang, 2000, pp. 65-66). Jiang (2000) indicated that semantics and grammar could not be retrieved from the memory automatically and they need a rule to follow. Also, they are not part of the mental lexicon. It can be said that they are part of lexical competence but not lexical knowledge.

According to Qian (1999), breadth and depth are the most popular in the second language vocabulary research as they are very important parts in word knowledge. The breadth of vocabulary knowledge relates to the number of words (the quantity); whereas, the depth means whether learners know the word well or not.

The breadth of vocabulary knowledge is related to the number of vocabulary items that learners need to learn the second language. This can be answered by knowing the amount of words that native speakers know and the number of words that occur in the target language (Nation, 2001). It was pointed out that the number of vocabulary words that educated native speakers know is around 20,000-word families (Zechmeister, Chronis, Cull, D' Anna, & Healy, 1995; Goulden, Nation, & Read, 1990). However, Nation (1990) claimed that in learning vocabulary, the focus should be on the 3000 most important words.

Three dimensions can be focused on to study vocabulary knowledge as Henriksen (1999) indicated: partial to precise knowledge; depth of knowledge; and receptive and productive knowledge.

The first, focuses on the idea that the knowledge going through three steps: realizing, understanding the words and mastering them. The second competence is depth of knowledge, a concept defined by Read (1993) as "the quality of the learner's vocabulary knowledge" (p. 357). Nation (1990) added that knowing a words' meaning and form does not necessarily mean learning vocabulary effectively. However, it is said that researchers should not focus on the expanding of the lexicon. Instead they should study the depth of a word (Schmitt, 1998). In order to understand the degree of knowledge of a word, two ways can be used: the development way and the dimension way (Read, 1997; Schmitt, 1998). The development way means definite stages of learning vocabulary. Paribakht and Wesche (1993) indicated five stages for learning a word. At the first level, the word is not familiar at all, then the word is familiar, but the meaning is not known. After a word becomes familiar, translation or synonyms will be given. In the next step learners will be able to use the word correctly in a sentence; finally, the word will be used in a sentence with correct grammatical form and semantic fitness. Based on word development, receptive knowledge of the word is developed in the beginning levels while productive knowledge comes in the more advanced level (Schmitt, 1998, p. 285).

On the other hand, the dimension approach refers to what extent students master different kinds of word knowledge. Nation's description of word knowledge is considered to be the most appropriate. Nation (1990, p. 31) listed the knowledge that learners should have about a word, and he also mentioned that these types of knowledge contain aspects related to reception and production:

1) The spoken form of a word;

2) The written form of the word;

3) The grammatical behavior of the word;

4) The collocational behavior of the word;

5) The frequency of the word;

6) The stylistic register constraints of the word;

7) The conceptual meaning of the word;

8) The associations the word has with other related words.

As Nation (2001) developed his idea about word knowledge, he claimed that there are 18 questions divided into three groups: "form" which has the spoken and written forms; "meaning" that contains form and meaning, concept and reference; and "use" which consists of grammar functions and collocations. Each group contains receptive and productive aspects.

According to Laufer (1997, p. 141), knowledge of a word means that learners should know the word's form, if it is spoken or written, its pronunciation and spelling; word structure - the basic free morpheme (or bound root morpheme). They should also know the common derivations of the word and its inflections; syntactic pattern of the word in a phrase and sentence and also its meaning: referential (including multiplicity of meaning and metaphorical extensions of meaning), effective (the connotation of the word), and pragmatic (the suitability of the word in a particular situation); Learners should also know lexical relationships of the word with other words, such as synonymy, antonymy, hyponymy; and Common collocations.

Moreover, three phases were created in regards to depth of knowledge and vocabulary acquisition: the first is the noticing phase which means learners' ability to explain meaning when a word is seen in context. The second is the analysis phase in which students can recognize and connect L2 words in the lexical field, this also contains the paradigmatic and syntagmatic relations. After this, learners will be able to connect new words with those that have already been acquired, and the new word will take its place in the lexicon when the structure and restructure relations set (Haastrup, & Henriksen, 2000).

2.1.1.1. Receptive and productive knowledge

The third measurement of lexical competence is the receptive and productive knowledge as determined by many researchers (e.g. Lin, Hsiao, Tseng, & Chan, 2014; Ma, 2009; Nation, 2013; Hanson & Padua, 2011; Mondria, & Wiersma, 2004; Nation, 1990).

According to Ma (2009), breadth and depth, reception and production are related to each other and it can be difficult to use them separately. It was claimed by Ma (2009) that "knowing a vocabulary item receptively is likely to require only shallow knowledge as covered by breadth; to know a word productively is likely to involve deep knowledge which may include various components covered by depth" (p. 40). Similarly, Nation (2013, p. 47) pointed out that "receptive vocabulary use involves perceiving the form of a word while listening or reading and retrieving its meaning" whereas "productive vocabulary use involves wanting to express a meaning through speaking or writing and retrieving and producing the appropriate spoken or written word form"

In addition, these ideas are clarified more in Lin et al. (2014) and Hanson and Padua (2011) who indicated that productive vocabulary means words used for communication in speaking and writing and which give learners the ability to use the word in expressions. The receptive is used for comprehension in reading and listening and it helps learners to understand a word in a context. Moreover, both types are connected since the receptive learning of vocabulary leads to productive knowledge and productive learning of vocabulary leads to receptive knowledge (Mondria, & Wiersma, 2004). In general, one's the receptive vocabulary is larger than their productive vocabulary (Thornbury, 2002; Nation, 1990) but productive learning of vocabulary is more difficult, and it needs more time (Mondria, & Wiersma, 2004). Similarly, Webb (2005) investigated the influences of receptive and productive activities on learning vocabulary. The results showed that when spending the same time on both elements, the receptive tasks are completed more readily than the productive tasks. In contrast, when using different amounts of time, the productive activities take longer than the receptive activities, but the productive activities were more efficient (Schneider, Healy, & Bourne, 2002). So, teachers should take the two types into consideration when teaching new English vocabulary.

Some researchers, e.g. Faraj (2015), claimed that receptive knowledge can be transformed into productive knowledge if teachers focus on materials, teaching methodology and learning contexts. Regarding materials, teachers should use materials that give students the chance to practice vocabulary during exercises that focus on both deep and surface

knowledge of vocabulary. It is also important to focus on different types of vocabulary like multi-words and collocations. This means that teachers should use teaching methodologies that encourage students to practice the language, and teachers should give students more information about words. However, Arab students learn English vocabulary by heart and they often complain that they do not know the vocabulary learning strategies that are appropriate for them, and they are not given the means to use vocabulary in a real context. Farag (2015, p. 13) added that students' productive vocabulary increased by 28% with the following six steps: the first, choosing the words that they like since when students are interested in learning vocabulary they will learn better. The second step is recording the words and monitoring the recording which means that students should have complete knowledge about the words; their spelling, pronunciation, meaning, the different forms, examples, synonyms, antonyms, grammar and collocations. This information can be acquired by using a dictionary. The third step is utilizing memory strategies such as describing pictures, connecting vocabulary to previous experience and using physical actions. If students recall vocabulary and use it in speaking or writing activities this will turn them into productive words. Moreover, sharing with others is very important way to improve their knowledge, as is assessing and monitoring learning where students assess each other to see if they use the words receptively or productively. Finally, Recycling the vocabulary where students are asked to write story, paragraph or report to practice using vocabulary correctly.

According to Harmer (1991), vocabulary can be divided into two types: active and passive vocabulary. Active vocabulary refers to words that students are learning and they are expected to be used with ease. Whereas, passive vocabulary refers to words students can recognize but, it seems that cannot pronounce. However, it is argued that sometimes passive vocabulary is the receptive knowledge, and the active vocabulary is the productive knowledge (Ma, 2009; Milton, 2009; Nation, 2001). In addition, Meara (1999) argued that the difference between active and passive vocabulary is that active vocabulary is linked to the lexicon with different kinds of connections. If a word is linked with a lexical set which is not active, this word will be considered passive. Active and passive items are also mentioned by Corson (1995) who claimed that these items are related to receptive and productive

vocabulary. But the degree of knowledge to distinguish them is not appropriate since some passive words are very familiar for learners although they do not use them, which means that they are not active "Passive" even if they are well known for students (Nation, 2001).

However, vocabulary could be categorized into two types: general service vocabulary (common words) and special-purpose vocabulary (words for academic purposes). Both types are important because different types mean different instructional processes (Nation, & Kyongho, 1995).

2.1.2. Vocabulary retention

Leaning vocabulary is not only difficult for learners but also very problematic for teachers (Al-Zahrani, 2011). However, students would not have high proficiency in a foreign or second language without gaining a huge number of vocabulary items (Farjami, & Aidinlou, 2013).

It was claimed that a large number of EFL learners find it difficult to communicate in English as a result of lack of vocabulary (Al-Zahrani, 2011). This shows that there is a relationship between the number of vocabulary items that students know and their communication since a wide vocabulary means good communication (Folse, 2008). Moreover, Oxford (1990) stated that the main objective for learning a language is to use it in communication and learners need to learn the four language skills to excel at a language. Vocabulary is a part of every language skill and improving it is the only way to achieve the goal of communicative competence. Besides, vocabulary is the integral part in learning to read (Coady, 1993). So, to improve English comprehension and production, learners should gain retention knowledge of vocabulary and this can only happen if learners utilize meaningful strategies which help them to acquire vocabulary retention (Al-Zahrani, 2011).

Vocabulary does not only affect communication skills but also comprehension skills. According to Oxford (1990), learners should know 90% of the vocabulary of the text they read. Though, a text cannot be understood if more than 10% of the text's vocabulary is unknown. Besides, Laufer (1992) showed that without knowing 3,000-word families, learners could not understand a text. Laufer (1989) argued that learners must know more;

about 95% of the lexical items in a text in the reading comprehension in order to guess the others. Bonk (2000) agreed with Laufer (1989) that this helps learners achieve good comprehension in listening passages. Some researchers like Hu and Nation (2000) remarked that learners have to know 98–99% of the words especially for written discourse. Moreover, some studies showed that learners who learn second or foreign languages should know 6,000-9,000-word families (Nation, 2006). According to Zhang and Annual (2008), students will be able to read a text with a low- frequency vocabulary if they know 2000- 3000 words in the foreign language. Schmitt (2008) indicated that to understand a text very well, learners need to know a wide variety of vocabulary in a foreign or second language, approximately 8,000-9,000-word families while for speaking the person needs 5,000-7,000-word families. However, to enrich children's knowledge in vocabulary, they have to interact with words in different contexts (Blachowicz & Fisher, 2004; Beck, McKeown & Kucan, 2002).

But which words should students study? This was explained by Nation (2001) who mentioned that the vocabulary that students learn depends on the four types of vocabulary that students face while studying a text or reading comprehension. The first one is the *high frequency words* that can be found in different kind of texts and oral conversations which make up nearly 80% of the texts' words. The second one is *academic words* which are popular in academic texts and they comprise almost 9% of the words. In addition, the *technical words* that are used only in special fields. However, these words are only 5% of the total words seen. Moreover, the last type of vocabulary is the *low frequently words*. This kind refers to the words that are not included in the other types, which again make up about 5% of the words.

2.1.2.1. How do students learn English vocabulary?

When teaching and learning vocabulary, it is important to mention that there is a great deal of information about a word so one explanation is not enough in order for it to be understood. The real learning of words happens with repetition and recycling of vocabulary (Schmitt, 2010; Nation, 2001). Besides, Milton (2009) showed that revising new learnt vocabulary is as important as repetition and recycling since the words' knowledge can be strengthened (Nation, 2001).

Nation (2001) argued that learning vocabulary goes through three steps which are important in remembering new words: noticing, retrieving and creative or generative. Noticing means that learners should pay more attention to new words and the benefit of them in language learning. This also shows the importance of motivation and interest in learning. The second step is retrieval, which means that after noticing the word it is the time to do a task to understand it better, and it is said that words will be kept in the memory if they are retrieved during a task. The last step is generation (creative or generative use). Which means that when learners meet or use a word which has different meaning from what they know learners are forced to "reconceptualise their knowledge of that word" (Nation, 2001, p. 70). This is related to receptive and productive knowledge. Finding a word in a reading or listening context (receptive) and using it in a speaking or writing context creates production. During these processes the quality and strength of word will be developed. Moreover, there is a relationship between learning vocabulary processes and vocabulary strategies. For instance, by using a dictionary as a tool to look up words, guess from context and have words explained encourages the noting process to occur (Nation, 2001, p. 63).

According to Milton (2009), when students use words and repeat them several times, it helps to learn the words. Moreover, Milton thinks that repeating the word seven times is enough to recall it. Whereas, Schmitt (2010) indicated that there are different numbers of repetitions in order to remember the new word, some think that five times are enough while others think this needs more than sixteen times of repetition. This based on different factors as Schmitt (2010) mentioned that "the number of exposures required to learn a word depends on a number of factors, including type of exposure, level of engagement and congruity between L2 and L1 form" (p. 33).

Vocabulary can easily be remembered by recalling and repeating them for few times if learners are motivated (Nation 2001; Schmitt 2010), encouraged to keep words in their memory (Schmitt & Schmitt 1995), and engaged (Schmitt, 2010). On the contrary, students who are unmotivated need to repeat the words more. Also, activities that do not foster students to recall words or where they do not use students' mental efforts like writing the words several times, require the student to continually revise words to remember them

(Schmitt, 2010). For example, connecting the word with objects or giving its meaning in the L1 play an important role in recalling words.

Moreover, if the words are short, with only one- syllable this doesn't mean that they are easier to learn than the multisyllabic words since some words can be explained or have meaning in the first language whether in the written or spoken form. This means that to be able to learn a new word, students need to see or hear it in objects and activities in the mother language. Then words start to be saved in the memory (Lightbown, & Spada, 2006). However, Lightbown and Spada indicated that this cannot be generalized as there are cognitive words which are difficult to learn.

According to Meara (1997), the link between new words and words that are already set in the learner's mental lexicon is precisely what helps vocabulary acquisition. This can be achieved in two ways; translate the L2 words into the L1 or correlate the new words in L2 with words students are familiar with from L2.

Previous studies investigated whether using the translation from the second language to the first language helps students to memorize vocabulary (e.g. Laufer, & Girsai, 2008; Laufer, & Nation, 2012; Lin, 2013; López-Jiménez, 2010). Laufer and Nation (2012) stated that teachers nowadays think that it is wrong to use L1 when explaining words in the L2 as López-Jiménez (2010, p. 158) said that translating words to the L1 "might prevent the student from developing an independent lexicon in the L2". On the other hand, it is stated that translating does not prohibit learners from learning the words in the L2. A study was done by Laufer and Girsai (2008) showed that using L1 in the classroom is very important in learning the language. In their study they discussed the significant role of using L1 in learning the second language showing the differences between words and expressions in the L2. Another piece of research conducted by Lin (2013) showed that translating a text into the L1 will help students to understand the text, and this way positively affects the learning of the second language. Milton (2009) argued that the results showed that translation from L2 to L1 and using wordlists in both languages helps students to learn quickly despite this way being said to be old fashioned. This way makes students learn words in a context which makes learning meaningful rather than simply memorizing the words alone (Hedge, 2000).

There are different ways of learning vocabulary. Ur (1996) argued that teachers can teach students by putting the words with similar meaning or similar aspects together as most learners tend to use this way in learning. On the contrary, Nation (2013) stated that teaching vocabulary by using synonyms, antonyms or words which are from the same lexical set with each other affects students' learning negatively since words with similar meanings and form are difficult to learn and to distinguish between. Similarly, it was noted in a study with adult at a beginner level and children at an intermediate level that it would be unhelpful for teachers to teach the related words at the same time. However, children in this study learnt vocabulary to a similar standard with related or unrelated words (Papathanasiou, 2009). So, students age and level in language play an important role in the outcomes of the strategies that teachers use.

When studying words, it is important to know that words can enter the mental lexicon and be understood as "double entries". The first entry consists of information about the word's meaning and the second, about the words' form. However, words with similar characteristics to the form, meaning or both are gathered (Thornbury, 2002, p. 17).

It is also important to know that general knowledge "world knowledge" and personal experiences "memory" are related to each other in learning vocabulary. So, it is uncommon for two people to have the same world knowledge. For instance, when learners learn about a bank and they have visited it, this helps them to acquire the related vocabulary better than students who have only learnt about the topic in class. Personal experience related to this vocabulary, whether positive or negative, is based on their real experience (Thornbury, 2002).

Acquiring vocabulary is directly related to the human brain and memory. It is said that memory can be divided into three parts: short-term memory, working memory, and long - term memory. The first one means that learners can retain information for a few seconds but learning vocabulary is more than acquiring vocabulary for a short time. Then the operations take place for different cognitive activities when words enter the working memory and stay there for about twenty seconds before entering the long-term memory. But this does not mean that all words stay in the long memory because most of them will probably be forgotten

without "repetition, retrieval, spacing, pacing, use, cognitive depth, personal organizing, imaging, mnemonics, motivation, attention and affective depth" (Thornbury, 2002, pp. 24-26). These processes keep words in the memory for a long time. Moreover, to learn vocabulary effectively, mental operations should be utilized and will deepen understanding and achieve "Cognitive depth" (Thornbury, 2002). Similarly, Hedge (2000, p. 121) stated that when the process of learning vocabulary becomes very deep, "input" becomes "intake", and this happens if learners not only analyze knowledge but also focus on challenging and relating vocabulary to their own existing knowledge.

Therefore, there are several reasons that students forget words. Thornbury (2002) argued that learners cannot remember some words for different reasons. For example, when students 'concentration is interrupted or dispersed during the storing process, these words will be easily forgotten. Also old words will be forgotten when new words are learnt, and when the words are not revised adequately. In addition, there are words that can easily be remembered, and others are difficult as they exist in the mental lexicon, but they have never been seen or used so they need time to be recalled (Hedge, 2000).

Technology can play a very important role in learning vocabulary. Students learn vocabulary better when using pictures and videos and with technology, websites and applications students learn vocabulary deeply and quickly (Blake, 2013). Also, chatting online and participating in forums help students to learn and acquire vocabulary (Polat, Mancilla, & Mahalingappa, 2013). Blake (2013) mentioned that there are new tools that help learners to learn and improve their vocabulary such as blogs, social networks and video or computer games. Moreover, if teachers neglect the advantages of technology in language learning, they do not only lose the chance to benefit from computer, social media, and language games, but they will have a negative influence on their relationships with their students as Blake (2013, p. xi) claimed:

> Either teachers embrace the new learning technologies and integrate them in a new pedagogy or they will not only deprive themselves of the enormous benefits afforded by computer-assisted learning, social networking, and language games, but they will be increasingly out of touch with their own students, who are now wired, networked, and computer-savvy.

Technology and learning vocabulary are clearly explained in part 2.

2.1.2.2. Why do EFL students have problems learning vocabulary?

Some researchers like Kulik (1994) and Oxford (1990) confirmed that learning vocabulary is a very complex process and learners have serious problems in remembering the large amount of vocabulary necessary to achieve fluency in a foreign language. In regards to this, Hadfield (1998) added that remembering a new word is very difficult and students need to fix the words and their meaning in their minds.

Arab students find many difficulties in learning English as a foreign language in general and learning vocabulary specifically. They also face great problems in pronunciation, spelling and syntax (Jdetawy, 2011). This is due mainly to three reasons as pointed out by (Nation,1990). First of all, students' previous experience of English and their native language is important. This is because the other language's vocabulary acquisition is affected by the first language and there is often interference between the vocabularies of the two languages. For example, learning the function and meaning of a word can be difficult since words rarely correspond exactly to a word in another language. Related to this, Swan (1997, p.163) claimed that English learners from different countries learn English to different degrees because of the "language distance". The language distance influences the "amount of transfer that can take place between languages" and it is said that "related languages often share a great deal of cognate vocabulary, and even when vocabulary is not cognate, there tend to be close translation equivalents: this can give learners an enormous advantage." In this study, it was shown that Spanish and Swedish students learn English vocabulary faster than Arab and Finnish students since the Swedish language is similar to English in syntax and lexis. The Spanish language also has lexical similarities with English.

The second reason is the way that learners learn or were taught a word. Nation (1990) showed that teaching has three effects on students' learning: positive, neutral and negative and these affect learners' acquisition of language. Arab students live in an Arab context, and they use Arabic language in the classroom. Also, the lack or even the absence of strategies that teachers use in the classroom make students unmotivated to practice the language (Jdetawy, 2011). Additionally, Alqahtani (2015) argued that in most Arab countries like Saudi Arabia, teachers focus on grammar rather than vocabulary and vocabulary is taught by

memorization and repetition so students cannot succeed in using the language in a real context.

The third reason is the intrinsic difficulty of the word that makes some words more difficult to learn than others. For example, nouns and adjectives are usually easier to learn than verbs and adverbs. According to Nation (2013), the obstacles that students face in learning vocabulary are related to the different learning burden of words. This term was defined by (Nation, 2013, p. 44) as "the amount of effort required to learn [them]", and this is affected by the learner's mother tongue. It means that learning a second or foreign language will be lighter "easier" for students whose first language is closer to new language; whereas, the burden will be heavier "more difficult" for those with completely different languages. Similarly, Thornbury (2002) added that in each language there are words which are easy to learn or have a "lighter burden" such as cognate words which are similar to words in the first language in either their phonology or orthography (Tonzar, Lotto & Job, 2009), like alcohol, Camel, cinema which are the same in Arabic.

On the other hand, Thornbury (2002) stated that some words are more complicated to learn than other "heavier burden" words because of their "pronunciation, spelling, length and complexity, grammar, meaning, range, connotation and idiomaticity" (pp. 27-28). In other words, vocabulary is not only a word, it can be more than that. Vocabulary items express feeling, attitude and their meaning. So, to learn vocabulary students must know word collocations, spelling, and pronunciation. The most significant thing is that vocabulary meaning can be found in the dictionary, but it is more than a meaning and more than a word; it is the words' knowledge for example, synonyms, opposites, complements and hyponyms (Martin, 1996). Similarly, August et al. (2005) summarized that to know a word, a student must know its pronunciation, both its literal and connotative definitions, its semantic relationship with other words, and how that word is used in different contexts. Nation and Meara (2010) added that English vocabulary is convoluted as one needs to learn the meaning related to the words' roots and three main aspects related to form, meaning, and use. It was discussed that "form" means that the word will be recognized when the person hears it, and they will also be able to know how to write and spell it. Moreover, "meaning" refers to know

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the meaning of the word. And, "use" which means how, where and when to utilize or find this word (Nation, 2013). It was claimed that even expert speakers will probably not know the whole functions of a word as Thornbury (2002, p. 16) said that "word knowledge is incremental and takes time". Thornbury added that it is difficult for students to know the word productively though it is easier to know it receptively.

Similar to Nation's idea about the obstacles in learning vocabulary, Takac (2008) and Laufer (1990) stated that two factors affect learning vocabulary: intra-lexical and extra-lexical. The intra-lexical factors are connected with the "intrinsic properties of words that might affect its learnability" (Laufer, 1990, p. 141). This includes a words' pronunciation, orthography, length, morphology, synonym, level of abstractness specificity and register restrictions, as well as idiomaticity and multiplicity of meaning (Laufer, 1990). However, not all students are affected to the same degree by each of them and the difficulty mostly depends on the linguistics background of the students (Ringboom, 1985; Swan, 1997). According to Sanusi (2009), a student's learning of vocabulary is affected by the components of language. This involves vocabulary and structure, vocabulary and sound systems, and vocabulary and spelling. In the second category are the extra-lexical factors which can help in the learning of any language (Ellis, 1994). This factor is related to students' language experience, their attitudes motivation and beliefs about language learning as well as students' social factors and their environment (Boonkongsean, 2012). Additionally, the extra-lexical factors are more significant than the intra-lexical.

Regarding extra-lexical factors and students' learning experiences and how they learn vocabulary, Yu-Ling (2005) found that there is a lack of instruction, vocabulary pedagogy and practical approaches to deal with students' problems in learning vocabulary which make learning vocabulary very difficult for learners so there is a need for pre-service or in-service teacher education programs to inform language practitioners. Also the material and the traditional way of teaching that depends on the multiple choice questions, gap-filling, and cloze worksheets that teachers use, cause learners to be shy to use the language or even to ask about anything in the classroom, they consider languages to be the most boring subject and they are unmotivated to recall words (Lam, 2013). Furthermore, the lack of opportunities

for using English language vocabulary, and classroom pedagogy does not focus on communication and this affects learners' use of the language and language development (Easterbrook, 2013). So, to encourage learners to learn vocabulary teachers should create an enjoyable environment that motivates students (Thornbury, 2002). According to House (1997) and Fletcher, & Garman (1986), teaching English vocabulary to children is more complicated than teaching adults. Children prefer to learn by doing, hearing and seeing. Therefore, teachers should understand students' needs, abilities and interests in order to make learning English vocabulary easier. On the other hand, Sweeny and Mason (2011) concluded that learners who are good in their first language, are able to learn the second and foreign languages easily.

2.1.3. Strategies for learning vocabulary

Learning vocabulary depends on three things: motivation, desire and needs (Hatch, & Brown, 1995). However, it is said that students are unmotivated to learn and memorize new words since it is a very complicated process. Therefore, teaching vocabulary must be a priority instead of grammar and teachers should use strategies that suit students' abilities and interests (Corrales, 2011).

It is worth mentioning that language learning strategies are the base of vocabulary learning strategies. This term contains two important words, which make defining this term different from one researcher to another, strategy and learning. Strategy means 'techniques', 'tactics', 'learning skills', 'potentially conscious plans', 'cognitive abilities', etc. (Wenden, 1987, p. 7), and learning refers to "the process by which information is obtained, stored, retrieved, and used" (Rubin, 1987, p. 29). However, this term was defined by Rubin (1987, p. 19) as "a set of operations, steps, plans and routines of what learners do to facilitate the obtaining, storage, retrieval and use of information, and to regulate learning". Additionally, Oxford (1990, p. 8) defined it as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations". Oxford's definition of LLS showed that these strategies help students to learn because they are interesting, and learner centered. Chamot (1987, p. 71) had a similar definition to Rubin's which sees language learning strategies (LLS) as "techniques,

approaches or deliberate actions that students take in order to facilitate learning". These definitions claim that LLS are physical or mental activities which attract students to learn, facilitate learning and improve it.

Similarly, vocabulary learning strategies are used to enhance learning vocabulary and recall new words (Cameron, 2001). Catalan (2003) added that these strategies are actions which students use to know the meaning of new words, memorize them and use them when they need to whether in speaking or writing activities. On the other hand, Nation (2001) indicated that the VLS should be characterized by different choices of strategies, complexity, giving knowledge, and they should improve the students' vocabulary.

Previous studies have shown that using different strategies in learning vocabulary not only helps learners to learn deeply and be more productive but they will also be motivated and their learning will be kept in the long-term memory (Hashemi, & Hadavi, 2015; Cohen, & Macaro, 2007; Winne, & Perry, 2000). Gu (2011) added that vocabulary learning strategies have changed, and this affects vocabulary development. Furthermore, they encourage students to be self- directed, help them to acquire the productive and receptive vocabulary words, and involve learners in their own learning to improve it.

It is important to know that when using learning strategies, learners should be taught previously how to use strategies, to get better results (Bastanfar, & Hashemi, 2014; Walters, & Bozkurt, 2009), because students who know how to utilize the learning strategies can benefit from the, whereas those who are not familiar with the strategies find them useless (He, 2010). However, there is a close relationship between vocabulary learning strategies, vocabulary knowledge and skill development (Wong, 2014). And, teachers should use strategies similar to those which students use because different strategies lead to frustration and learning objectives may not be achieved. So, it is important to be familiar with the learning strategies that learners use (Bull, & Ma, 2001). Moreover, learning strategies help students to learn new information and they help students to enhance their learning and this improves their communication skills (Oxford, 1990). Furthermore, in order to succeed, foreign language learners should use the learning strategies effectively and when students choose strategies that integrate with their abilities, they will be active learners (Gallo-Crail,

& Zerwekh, 2002). In other words, learning strategy is "one of the most important skills that students need to master in order to achieve success in language learning" (Gallo-Crail, & Zerwekh, 2002, p. 57).

2.1.3.1. Vocabulary learning Taxonomies

Language learning strategies have been divided into direct and indirect strategies by researchers who are very well-known in this field (e.g. O'Malley, & Chamot, 1990; Oxford, 1990; Rubin, 1987). However, Oxford (2011), Ma (2009), Nation (2001) and Schmitt (1997) used different taxonomies of learning strategies. Although they use other names, some of their ideas are related to the old taxonomies.

Rubin (1987) classified LLS taxonomies into: direct strategies in which students learn directly (metacognitive and cognitive strategies); and indirect strategies (communicative and social strategies). Rubin's taxonomy is very important since it is the first study that classified these learning strategies. It was identified that the cognitive learning consisted of six strategies: clarification/verification, guessing/inductive inferring, practice, memorization, deductive reasoning and monitoring. This shows that this strategy uses synthesis or analysis learning materials. On the other hand, metacognitive strategies depended on self- learning in which students are responsible for their own learning, as well as the planning and management of that learning. However, communication strategies use synonyms, gestures, mime, cognates, circumlocution to get meaning across while participating in a conversation, which, while considered useful, are not advantageous to learning. Similarly, social strategies which motivate students to practice and use the language, like listening to L2 media, initiating conversations or addressing questions to teachers or students, do not help students to learn or to use the language directly (Rubin, & Wenden, 1987).

However, Rubin's taxonomy focused on the direct strategies more than the indirect strategies. It seems that the differences between communicative and social strategies are not clear since they can be used for the same purposes.

According to O'Malley and Chamot's taxonomy (1990), language learning strategies can be divided into three categories: metacognitive, cognitive and social/affective strategies.

The researchers' cognitive and metacognitive strategies are similar to Rubin's strategies. Whereas, O'Malley and Chamot (1990) use different strategies from the communicative strategies, which are social/affective strategies. These strategies focus on collaborative learning and control students' emotions. These are clarified more by oxford (1990).

Although Oxford depends on Rubin's taxonomies, the researcher classified the strategies differently. Oxford (1990) showed two main strategies for learning vocabulary: directly and indirectly. The direct strategies were identified as "language learning strategies that directly involve the target language and [They] require mental processing of the language, (memory, cognitive, and compensation) do this process is different for different purposes" (Oxford, 1990, p. 37). Whereas, the Indirect strategies "support and manage language learning without directly involving the target language" (Oxford, 1990, p. 135) and they are divided into metacognitive, affective, and social Strategies. Similarly, Nation (1990) divided the learning of vocabulary into two camps: direct and indirect. In direct learning, students learn with exercises and tasks that focus on vocabulary. On the contrary, indirect learning activities focus on a message to be conveyed rather than the vocabulary.

Oxford classified some strategies differently from Rubin (1987) and O'Malley and Chamot (1990). The metacognitive strategies were considered indirect strategies by Oxford, not direct like Rubin's classification, since they encourage learning. Also, social and effective strategies are used separately by Oxford (1990) as opposed to together by O'Malley and Chamot (1990). Effective strategies are connected with learner's emotions. While social strategies are related to the connection with the language. Oxford used the compensation strategies instead of communication strategies which was used by Rubin (1987), but they refer to the same meaning. On the contrary, Oxford classified the compensation strategies as direct strategies rather than indirect, since they support learners to be more fluent in the language as explained in the following figures:

A) Direct strategies

Memory strategies

A. Creating Mental Linkages
  1. Grouping
  2. Associating / Elaborating
  3. Placing New Words into a Context

B. Applying All Images and Sounds
  1. Using Imagery
  2. Semantic Mapping
  3. Using Keywords
  4. Representing Sounds in Memory

Memory Strategies

C. Reviewing Well
  1. Structured Reviewing.

D. Employing Action
  1. Using Physical Response or Sensation
  2. Using Mechanical Techniques
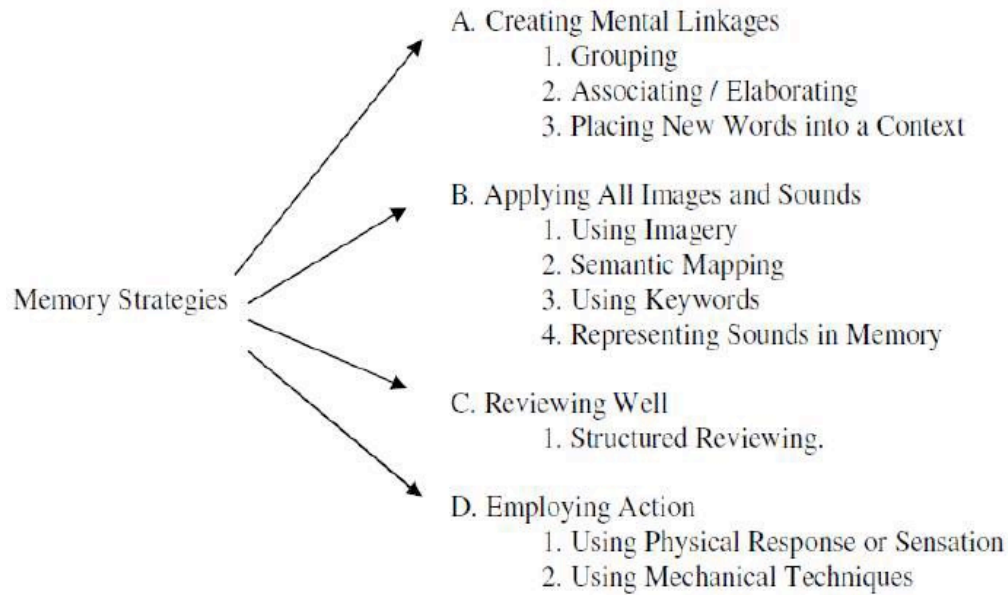
Figure 1. Diagram of the Memory Strategies (Oxford, 1990, p. 39.)

Cognitive strategies

A. Practicing
  1. Repeating
  2. Formally Practicing with Sounds & Writing System
  3. Recognizing and Using Formulas and Patterns
  4. Recombining
  5. Practicing Naturalistically

B. Receiving and Sending Messages
  1. Getting the Idea Quickly
  2. Using Resources for Receiving and Sending Messages

Cognitive Strategies

C. Analyzing and Reasoning
  1. Reasoning Deductively
  2. Analyzing Expressions
  3. Analyzing Contrastively (Across Languages)
  4. Translating
  5. Transferring

D. Creating Structure for Input and Output
  1. Taking Notes
  2. Summarizing
  3. Highlighting

Figure 2. Cognitive Strategies diagram (Oxford, 1990, p. 44)

Compensation Strategies
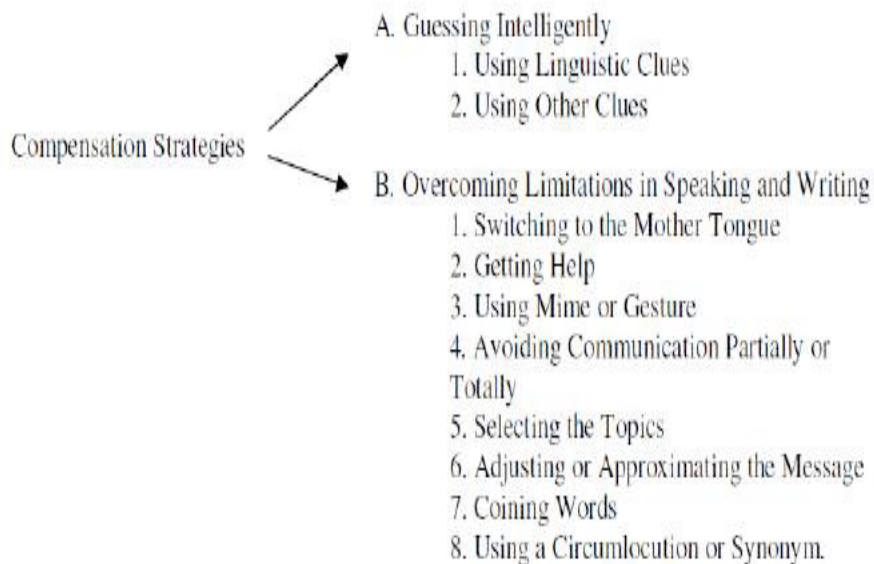
Figure 3. Compensation Strategies diagram (Oxford, 1990, p. 48)

B) Indirect strategies

Students learn with activities without focusing on the learning itself.

Metacognitive strategies
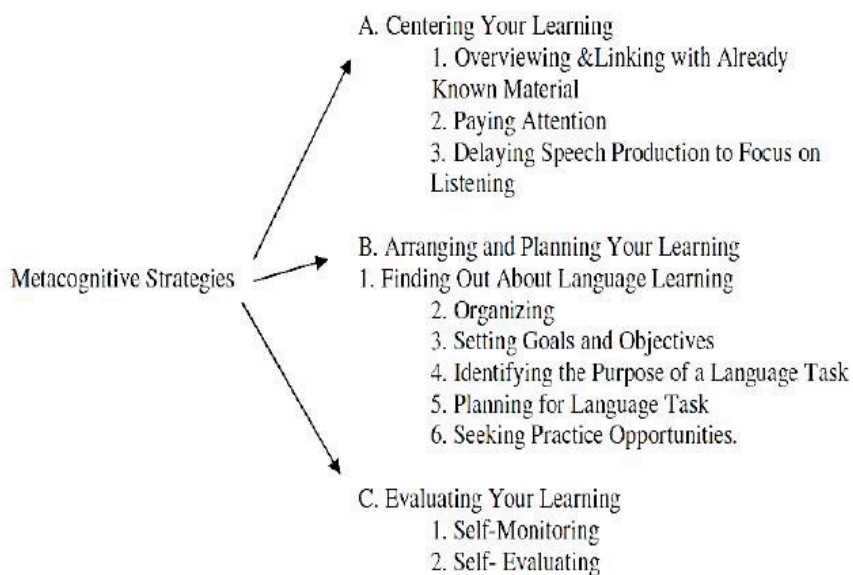
Figure 4. Metacognitive Strategies diagram (Oxford, 1990, p. 136)

Affective strategies

A. Lowering Your Anxiety
  1. Using Progressive Relaxation, Deep
  Breathing and Meditation
  2. Using Music
  3. Using Laughter

Affective Strategies

B. Encouraging Yourself
  1. Making Positive Statements
  2. Taking Risks Wisely
  3. Rewarding Yourself

C. Taking Your Emotional Temperature
  1. Listening to Your Body
  2. Using a Checklist
  3. Writing a Language Learning Diary
  4. Discussing Your Feelings with Someone
  Else

Figure 5. Affective Strategies diagram (Oxford, 1990, p. 141)

Social strategies

A. Asking Questions
  1. Asking for Clarification or Verification
  2. Asking for Correction

Social Strategies

B. Cooperating with Others
  1. Cooperating with Peers
  2. Cooperating with Proficient Users of the
  New Language

C. Empathizing with Others
  1. Developing Cultural Understanding
  2. Becoming Aware of Others' Thoughts and
  Feelings
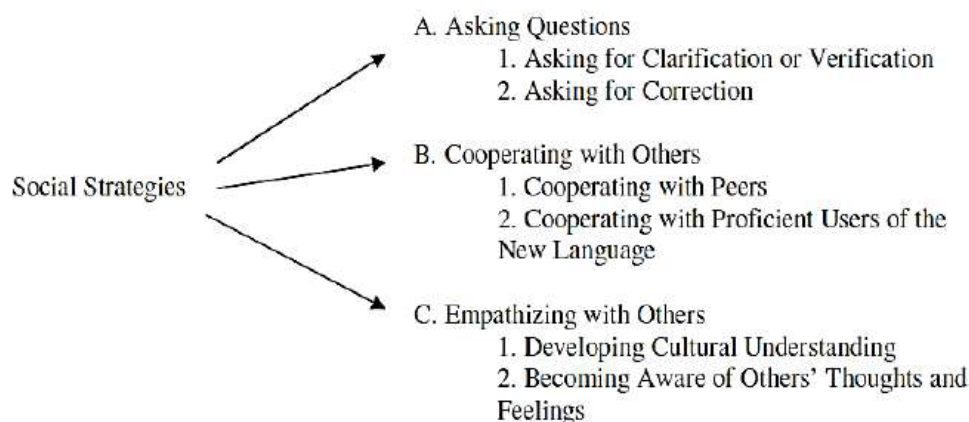
Figure 6. Diagram of the Social Strategies (Oxford, 1990, p. 145).

Many studies discussed the significant role of direct strategies in learning English vocabulary. According to Arellano (2017), some students prefer to learn with memory strategies like memory pictures. This way helps students to improve their vocabulary since it helps them to memorize and recall vocabulary easily. Besides, these strategies develop learners' short and long-term memories. As well as improving the pronunciation and spelling of the words. In addition, Verliyani (2016) agreed that direct strategies are very useful, and this comes as a result of a study which shows that teachers should use the ostensive approach

in teaching vocabulary, utilizing realia, pictures, body movement, gestures, sound and meaning, repetition, written form and illustrative sentences. Sweeny and Mason (2011) added that learners who have problems in learning vocabulary should learn via direct strategies like pictures, songs and visual aids.

However, a number of studies (e.g. Ta'amneh, 2015; and Taheri, 2014) argued that indirect strategies are the best way to learn vocabulary. Taheri (2014) used games as an indirect strategy for teaching vocabulary and the results showed that this way has a number of benefits to the learners' achievement and performance. Even weak learners liked the challenges in the games and they participated more to win. Moreover, games create social interaction, and students who learn with games can recall more vocabulary than those who learn in the traditional way. Ta'amneh (2015) presented some teaching strategies that teachers could use in teaching English vocabulary like multimedia, dictionaries, asking for help, using pictures and sounds. These strategies facilitate the learning of new words, but he added that using technology is the best way for learning vocabulary for today's students. Ta'amneh (2015) also claimed that it is more important to know what is appropriate or not appropriate for today's students rather than concentrating on the direct and indirect terms. This is clear in the study undertaken by Dourda, Bratitsis, Griva, and Papadopoulou (2014), which indicated that with elementary students, 100% of them use compensation strategies, 82% use social strategies, 76% use cognitive strategies and a limited number of students use memory strategies 65%.

On the other hand, Schmitt (1997, p. 205) used different language learning strategies which concentrate on vocabulary (vocabulary learning strategies "VLS"). These strategies are very important for learning vocabulary based and expanding on Oxford's taxonomies. According to Schmitt (1997), Oxford's Taxonomies were not suitable for learning vocabulary for many reasons: first of all, Oxford (1990) used only one strategy that helps students to discover the meaning of a new word which is asking others. Secondly, Oxford uses memory and cognitive strategies separately, while Schmitt (1997) argued that it is not easy to decide whether some strategies are memory or cognitive; especially in learning vocabulary since both strategies help learners to recall vocabulary. Schmitt (1997) clarified

this by describing cognitive strategies as various tools and mechanics that help students to memorize words like using a vocabulary notebook. Whereas, memory strategies work on organizing the information in the brain and help learners to remember them easily. However, Schmitt (1997) thought that these two strategies shouldn't be treated as something separate. What is more noticeable is that if a strategy is used in different situations and for different aims then it will be classified differently. It is clear that Oxford's (1990) strategies can be used for different purposes which means that they can be part of more than one group (e.g. contact with native speakers is not only a social strategy, it may also be metacognitive).

However, Schmitt (1997) divided the strategies for learning vocabulary into two main categories: strategies to discover a new word and strategies used to consolidate the meaning of a new word. Also, the researcher depends on Oxford's (1990) four strategies: social, memory, cognitive, and metacognitive strategies as clarified in figure 7 below.
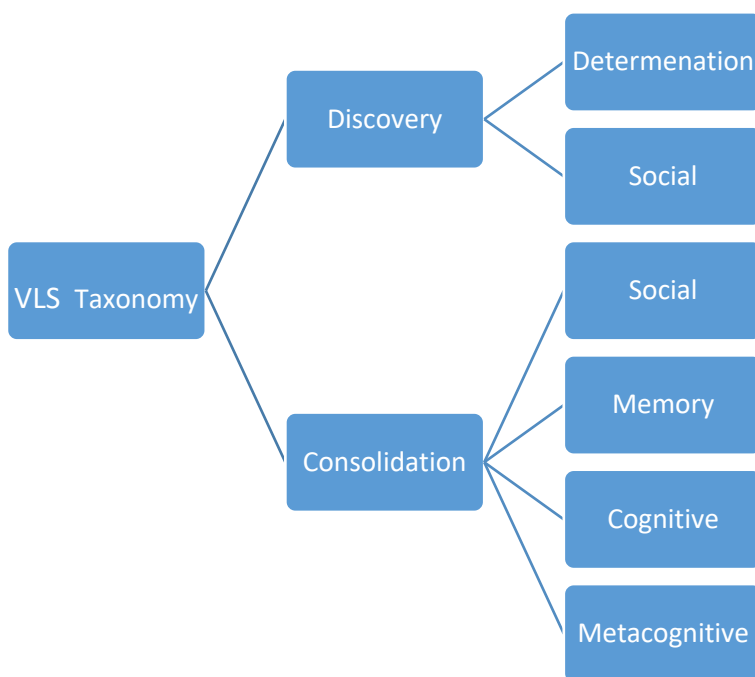
Figure 7. Schmitt's VLS taxonomy (1997)

Schmitt (1997) believed that students need to discover the new words' meaning with two main strategies. Determination strategies in which students guess the word meaning from context, use world lists, analyze affixes and roots, use flash cards, check for L1 cognates,

analyze any available pictures or gestures, guess from textual context, and using a bilingual dictionary. Social strategies include asking a classmate about the meaning and asking the teacher for an L1 translation or paraphrase. Also, teachers may be asked to give students the synonym of new word, a sentence including the new word, and students discover new meanings through group work activities (Nosratinia, Divani, & Zaker, 2013).

The second step is to consolidate the meaning of the word in students' minds and this can be done using four strategies: social strategies (e.g. being in contact with native speakers and practice words in groups), memory strategies (e.g. using the keyword method and study words with pictures), cognitive strategies (e.g. using a vocabulary notebook, word lists and flash cards), and metacognitive strategies (e.g. using English-language media (songs, movies and newscasts)).

These results were found after Schmitt (1997) had investigated the strategies that students use to learn vocabulary. This study was conducted with 600 Japanese EFL students who are junior high school pupils, university students and adult learners. The findings showed that surprisingly, students do not use the strategies that they think are most helpful, they use different ones. Also, the results indicated that a great number of students 85% use a bilingual dictionary, 76% of students use written repetition, 74% focus on studying the words' spelling and guessing the words' meaning, and 73% of students prefer to ask their classmate about the meaning of the words. On the contrary, Schmitt (1997) found that the strategies that deal with performance are used very little such as: physical action at 13%, semantic mapping 9%. This is normal since it is a foreign language.

It was stated that Schmitt's (1997) taxonomy can be easily used with students of different ages despite their educational background and target languages (Catalan, 2003). So, many researchers such as Catalan (2003), Kovanen (2014) and Fan (2003) used Schmitt's (1997) taxonomy in studies that investigated students' age and different cultural background in learning vocabulary. Moreover, Reiss (2008) divided learning strategies into four broad types: metacognitive, cognitive, social, and compensation. Additionally, Amirian and Heshmatifar (2013) used Schmitt's (1997) taxonomy and pointed out that learners can learn vocabulary using determination (DET), cognitive (COG), memory (MEM), metacognitive

(MET), and social strategies (SOC). Also, they added that the nature of vocabulary is an individual or social process so most students depend on a dictionary or guessing the meaning as a tool for learning vocabulary.

However, Intaraprasert (2004) applied Schmitt's (1997) taxonomy but with a focus on students' actions while learning new words outside the classroom. It was found that students use different strategies like using online dictionaries, speaking Thai with English-loan words and saving words on their computers.

In 2001, Nation introduced a new vocabulary learning strategy taxonomy. In this taxonomy he aimed to distinguish between the features of vocabulary knowledge, the source of vocabulary knowledge and the process of vocabulary learning. These also contain different sets of strategies.

The first phase is "Planning", which focuses on paying attention to words by asking different questions for example: where, how often and how. The strategies in this category focus on choosing words based on word knowledge and the repetition planning for the item. The planning stage has features in common with metacognitive strategies since both of them focus on self-regulatory learning in which students are able to organize their learning. This term was considered to be more significant than the different use of strategies (Tseng, Dörnyei, & Schmitt, 2006).

The second phase is "source" as indicated by Nation (2001), in this stage students will be able to find information about a word which can be gathered from several sources such as dictionaries, context and from the form itself. This is similar to the discovering category in Schmitt's taxonomy. However, the source of discovery helps students find the meaning of new words.

Finally, there is the "processes" phase, in which learners increase their knowledge about a word with three processes; noticing, retrieving and generating strategies. First, students should see the word, then retrieve it by doing different activities like repeating it in written or spoken forms and connecting it to a new word with previous knowledge. Also, they should use the word in different contexts. These processes are however, closer to

memory and cognitive strategies in which they help students to memorize and recall a new word.

Ma (2009, p. 164) listed eight stages in which learners can acquire new words as follows:

1. A new word is encountered in different contexts
2. The meaning of the word is discovered
3. Various aspects of the meaning and form of the word are studied
4. The information about the word is recorded or organized
5. The word is memorized with the help of some strategies
6. The word is reviewed to ensure retention
7. When the word is met again, it is retrieved
8. The word is used to consolidate its acquisition.

Ma (2009) added that in each stage different strategies can be used as shown in table 25 below:

Table 1

Vocabulary learning strategies listed by Ma (2009).

Stages of vocabulary acquisition	Category of strategies
How do you discover new vocabulary?	Cognitive strategies Social strategies Metacognitive strategies
What do you do on encountering new vocabulary?	Metacognitive strategies Cognitive strategies Social strategies
When learning a new vocabulary item, what aspects do you study?	Cognitive strategies

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How do you organize the information about the new vocabulary?	Metacognitive strategies Cognitive strategies
How do you memorize vocabulary?	Cognitive strategies Memory strategies
How do you review vocabulary?	Metacognitive strategies Social strategies
How do you retrieve vocabulary?	Cognitive strategies
How do you make use of new vocabulary?	Metacognitive strategies Social strategies

As explained above, Ma (2009) used four main strategies in vocabulary learning stages which are: memory, metacognitive, cognitive and social.

Some researchers like Fishkin (2010) presented five strategies that can help learners to learn English. The first is building vocabulary; the second is visual aids; followed by hands-on learning; modeling; and finally student-to-student interaction. Building vocabulary and background knowledge are key components in comprehending a task or literature. The most important thing about vocabulary is that it needs to be explained, and teachers need to remember to never make assumptions of their students. Teachers must always provide background knowledge for the given vocabulary. Visual aids are an important strategy for students as they help them to remember new words.

Based on previous studies about the learning strategies, Ansari, Vahdany, & Sabouri (2016) found in their study that female learners use psycholinguistic and metacognitive strategies more than male learners. According to Wong (2014), Chinese students use translation, metacognitive regulation, memory and cognitive strategies more than determination, metacognitive and social strategies and they depend on memorization without understanding in learning English because they simply want to pass exams. Also, students don't use social strategies very often and they prefer to learn from their friends and not from

family members. Martin (2013) showed in his study with Spanish students that the translation strategy is useless and uninteresting, and students are only able to learn passive vocabulary as opposed to active. Easterbrook (2013) argued that the most popular strategies that students use to learn vocabulary are: guessing meaning, looking up the word in a dictionary, learning its spelling, writing it down, learning its pronunciation, saying it aloud, and connecting it with the Chinese meaning. Also, teachers can use the first language in the classroom as a strategy to teach English vocabulary if the students' level of proficiency is not high enough to understand meta language (Bastanfar, & Hashemi, 2014).

According to Sanusi (2009) and Yu-Ling (2005), most English teachers use similar techniques such as: reading a text, asking the student to repeat it, pointing out the most complicated of the keywords, giving the definition of a word, getting the student to find synonyms or antonyms, and providing speaking opportunities to the students proposing a variety of questions relating to the subject being discussed. So, students always complain that they find difficulties in learning vocabulary because of the lack of strategies or inappropriate strategies that teachers use, and students acquire most vocabulary learning strategies from their friends, not from their teachers (Marttinen, 2008).

Oxford (2011) presented a new strategy which is the Self-Regulation (S2R) Model of language learning. In this way students are active and apply strategies that suit their learning. This type of strategy consists of different concepts. The first is *metastrategies* which help students to control their learning and use the other three types of strategies: cognitive, affective, and sociocultural–interactive. The guide for this model is the *metaknowledge* which consists of five types: person, group or culture, task, whole-process, and strategy knowledge.

Personal knowledge focuses on individual learning styles, goals, strengths and weaknesses whereas Group or culture knowledge deals with groups or cultures rather than individuals. Task knowledge is related to the tasks' characteristics and needs in the second language. Whole-process knowledge deals more with the process of learning in the long term. This type is for learners who want to master learning (Simons, Vansteenkiste, Lens, & Lacante, 2004). Finally, the knowledge strategy is concerned with learning strategies and

meta-strategies, and their working procedures which can be examined in practice. Moreover, this enhances the *conditional knowledge* which shows when, why, and where to use a strategy. Besides, the model consists of *tactics* in which specific students are put in a setting to achieve certain purposes.

Winne and Perry (2000, pp. 533–534) clarified strategically self-regulated learners in the following way: "Strategic" describes the way in which these [self-regulated] learners approach challenging tasks and problems by choosing from a repertoire of tactics those they believe best suited to the situation and applying those tactics appropriately". And they added that "The labels of tactic and strategy also reflect differences in grain size, the latter being larger" (p. 557).

Moreover, the S2R strategy integrates psychological, social-cognitive, and sociocultural traditions of learning theory. This comes as a result of the understanding that the learning of a second language not only depends on cognitive and metacognitive processes but also it is related to beliefs, emotional associations, attitudes, motivations, sociocultural relationships, personal interactions, and power dynamics (Oxford, 2011, p. 40). In addition, it is said that tactics make the model adaptable and flexible.

It seems that the self-regulation strategy is very important since Nation (2001) mentioned it in the first stage of learning vocabulary. When students can organize their learning, they can use appropriate strategies. Moreover, this also forms part of the metacognitive strategies which depend on planning as defined by Schmitt (1997).

Finally, Schmitt (2010) claimed that researchers should study the quality of strategies for students learning instead of the quantity of strategies that students use. Also, what is really important in learning vocabulary is to use strategies that engage students to learn and achieve the learning purposes (Hanson, & Padua, 2011).

All the previous studies investigated vocabulary learning strategies in traditional classes. But it seems that no study showed what strategies learners can use when learning vocabulary with a computer or other technology since VLS help students to know "how to learn and what to learn" (Gu, 2011, p.116).

However, it was stated that some online games like massive multiplayer role play online games MMORPGs can be used as "…vocabulary learning strategies…" Bytheway (2011, p. i), since they motivate students to learn independently.

2.1.3.2. Different strategies for different students' characters

It is important to know that choosing suitable strategies that help students to learn effectively depends on different variables. Pujol (2008) remarked that learners' age, gender and interest affect the types of learning strategies that students use to learn vocabulary. In addition, Alqahtani (2015) addressed different techniques teachers can use to teach English vocabulary and teachers should choose the techniques that suit students' ages and interest like drawing, using pictures, enumeration, mime and gesture, and guessing from the text.

It seems that the linguistic skills of females are higher than those of males, even though they have the same linguistics potential (Rua, 2006). And it is said that male and female learners use different strategies to learn vocabulary, and that females use a wider variety (Catalan, 2003). In relation to this, Alhaysony (2012) studied the vocabulary strategies that Saudi Arabian students use. This was study conducted with 746 Saudi male and female EFL students. The most used strategies were social and skipping strategies, while the lesser used strategies were guessing and dictionary consultation. The most significant finding is that female use these strategies more than males.

Males use autonomy and note taking strategies, whereas, females prefer social strategies (Hashemi, & Hadavi, 2015). Similar results showed that males prefer the strategy with pictures whereas females use formal rule strategies, input elicitation, rehearsal and planning strategies (Catalan, 2015). Moreover, Catalan (2003) added that females often use consolidation and discovery strategies, and this affects females' motivation to study languages. A recent study by Alghamdi and Al Ahmed (2018) with female Saudi Arabian university students showed that females learn better with role playing and blended strategies than drills, mini-presentations, and dictionary consultation. On the contrary, males use technology and ICT in education more than females (Broos, 2005; Shashaani, & Khalili, 2001).

The other factor that should be taken into account when using strategies is age. Teachers should use different strategies to teach vocabulary like demonstration, using real objects, drawing sketches, using the board to show scales, antonyms, synonyms, verbal explanation and translation. In the early stages, the teacher should introduce the new words in lexical sets, rhyming sets, color sets and grammatical sets since young students are fast learners, but they need to understand the items in order to not forget them (Martin, 1996). On the other hand, Peacock and Ho (2003) pointed out that mature learners, who are 23 years old and over, use more strategies than younger learners.

Moreover, students' ability also affects the use of techniques and strategies in the classroom such as watching TV, communicating, writing during memorization and doing dictation practice, learning vocabulary from the text, learning by daily life activities and with cards (Ellis, 1994) Another factor that affects the strategies that students use to learn vocabulary is the students' level. The results of a study conducted with Thai second year students by Rojananak and Vitayapirak (2015) confirmed that most of the students used an English-Thai dictionary to find the meaning of the new words, and high-grade students guessed the meaning from the text, whereas low grade students asked their classmates about the meaning.

According to Easterbrook (2013), students like to use the strategy that they believe will work better than other strategies so there is a connection between what students believe, and what strategy they use. Also, Ta'amneh (2015) argued that teachers' and students' beliefs are very important in the learning process and this can affect students' behavior toward learning English vocabulary. Thus, learners always use different strategies to learn new words. They guess their meanings, learn their pronunciation, look them up in dictionary, learn their spelling and write them down, say them aloud, and connect them with their mother language. Moreover, learners believe that to learn new words they need to memorize the words and repeat them, guess their meaning from the context or memorize their meaning in their first language.

A study conducted by Agudo (2014) with Spanish students showed that the way students learn affects their learning and their attitude toward the language they are learning.

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Also, students are not happy with the traditional way of teaching vocabulary which depends on translating Spanish to English or vice versa and they said that this negatively affects their communication in English. So, teaching strategies should be used to make learning English more efficient like games, pictures and other techniques to teach vocabulary. Besides, teachers should encourage their students to practice the FL which in turn leads to incidental acquisition of FL vocabulary (Bisson, 2013). This could only happen by using strategies that show learners that learning vocabulary is an enjoyable task instead of thinking about it as something inflexible (Zhang et al., 2017). To be clear, vocabulary learning strategies play a main role in learning vocabulary effectively (Bastanfar, & Hashemi, 2014). Moreover, Farjami and Aidinlou (2013) and Schmitt (2008) added that to help students learn new words and keep them in the long-term memory, teachers should utilize vocabulary strategies. Nevertheless, there are several VLS that encourage student to use the new words like group work, pictures, extensive reading, real objects, pictures, miming, defining, exemplifying, and games.

2.1.3.3. Games as a strategy to teach vocabulary

According to Nugroho (2007), teaching vocabulary is not an easy task, so teachers need to be creative in order to attract students' attention and they should also know their students' abilities and interests in order choose the best way to teach them (Keshta, & Al-Faleet, 2013). This is because vocabulary achievement is affected by learning, and students prefer to learn using new strategies like games (Al-Lahham, 2016).

Children face lots of difficulties in learning languages. Derakhshan and Khatir (2015) claim that using games in teaching vocabulary helps students to overcome the difficulty in learning new vocabulary as they stimulate students' motivation to learn, improve communication skills and create a meaningful context in the language. Also, previous studies show that games are very entertaining tools for young learners (Gruss, 2016). Students learn vocabulary effectively by using games and activities and each game has three stages: memorizing, personalizing and communicating. Teachers can choose the stage that suits their students (Hadfield, 1998). This way increases students' performance in learning vocabulary and improves their achievement (Nugroho, 2007).

Additionally, games create a fun atmosphere, prompt students to learn language effectively and to enjoy what they are learning. They are also considered to be the most beneficial strategy for children because they help them to understand the world and make them learn more easily, but it is very important to know when and how to use them (Klimova, 2015). Furthermore, children prefer to learn with games as they make them feel comfortable and happy during their learning experience. Also, weak students participate and learn better by playing games and, students prefer to learn indirectly (Taheri, 2014). Players can, learn from each other and learners learn better when they are interested, and they prefer to use games to increase their knowledge. In addition, learners play and enjoy games even though they are educational, and they spend more time in learning because of them (Turkay, & Adinolf, 2012).

The results of the study by Efendi (2013) agreed with Taheri (2014) that using games in teaching vocabulary improves students' learning, motivates them to learn, reduces stress and develops the four language skills. Moreover, Harb (2007) conducted a study with sixth grade Palestinian students using educational games. The results showed that students learn English better with games than in the traditional way. But, female achievement results were better than male achievement test results. Similarly, Azar (2012) showed that learners who learn via the traditional way that depends on memorization find it very boring. So, learning should be more attractive, using games to improve students' learning skills and achievement. Keshta and Al-Faleet (2013) added that games positively affect students' learning. Based on the findings by Kangas (2010), the integration of fact and fiction and a playful learning environment in teaching, studying and learning fosters activity, creativity, imagination, and group work skills – along with academic achievement. Students were able to learn through a co-creation environment, use their imagination and work in groups to learn. This also makes the role of the teacher in this class a tutor and a lesson planner.

However, Yolageldili and Arikan (2011) claimed that although teachers believe in the positive effects of games in learning English, they do not use them as expected.

2.1.4. Vocabulary learning approaches

It is worth mentioning that there are different approaches in learning vocabulary. Incidental learning vs. intentional learning; explicit vs. implicit; and formal vs. informal. Moreover, these approaches contain the vocabulary learning strategies that learners use to learn.

2.1.4.1. Incidental and implicit

Incidental learning is what happens unintentionally without planning to learn or to analyze language, and this may include implicit learning (Kerka, 2000). While intentional learning happens when using activities that focus on learning vocabulary and lexical information (e.g. sound, spelling, meaning and grammar) (Hulstijn, 2001). However, according to Kennedy (2003) the integration between intentional and incidental learning could be the best way to learn vocabulary.

Implicit learning is defined as "acquisition of knowledge about the underlying structure of a complex stimulus environment by a process which takes place naturally, simply and without conscious operation" (Ellis, 1994, p. 1). Whereas explicit learning is claimed to be "a more conscious operation where the individual makes and tests hypotheses in a search for structure" (Ellis, 1994, p. 1). It was argued that few words can be retained from those which are "learned" or "taught" by direct instruction (Harris, & Snow, 2004, p. 55) and "most of second language vocabulary is learned incidentally, much of it from oral input" (Ellis, 1994, p. 24). However, according to Ellis (1994), semantic and formal aspects of vocabulary acquisition are unconnected in which semantic aspects. This means that form and meaning connections need to be consciously learnt, and this can happen by explicit learning. Whereas the formal aspects of words refer to phonetics and phonological characteristics which can be learnt by implicit methods. This shows that formal aspects come first then the semantics aspects which related to words' meaning and use.

However, researchers such as López-Jiménez (2010) and Schmitt (2010) focused on the importance of the explicit learning of vocabulary. Schmitt (2010) claimed that when learners learn explicitly and concentrate on vocabulary, they learn better than learning

incidentally or implicitly. This is also confirmed by López-Jiménez (2010) who concluded that vocabulary should be learned explicitly. These results appeared after conducting research which showed that using a bilingual dictionary when reading to find the difficult words meant these students outperformed those who did not.

Incidental and implicit learning are different. Incidental aspect means learning without intention when students learn something while doing something else. In general, learners are aware of the learning that is occurring. On the contrary, in implicit learning, learners are unaware of the learning process (Schmitt, 2000). But, it seems that intentional and explicit learning are the same as defined by Hulstjin (2001, p. 271) as "any activity geared at committing lexical information to memory".

Hunt and Beglar (1998) argued that different approaches can be used for different learners' levels. The strategies that the incidental learning uses such as guessing the meaning from the text shows the appropriateness of this method for advanced level students. Furthermore, the intentional and explicit learning are suitable for beginners in which learners learn a list of words or use the dictionary. For example, learning vocabulary intentionally by using word cards and a dictionary are very useful since this way works for receptive and productive learning. For instance, using cards with words in the target language and the translation in L1 helps students to learn words receptively. When students recall the form of the word this may lead to productive learning (Nation, 2001).

In order to decide which learning approaches to choose, it was necessary to identify some principles which were found by Schmitt (2008). The first principle is that learners should choose activities that motivate and enhance learning vocabulary. This can happen by incidental and explicit approaches. The second principle is to consolidate the words in the mental lexicon by repeating them. This theory agreed with Nation's (1990) who believed that keeping words in students' memory is the most important part of learning. Finally, the last principle focuses on lexical knowledge. This comes as a result of giving words' meaning and ignoring the other word knowledge.

According to Huckin and Coady (1999), incidental learning in vocabulary is very efficient since it is an individual task in which students decide which words they want to study. This way links reading and listing with vocabulary acquisition which is pedagogically useful, and vocabulary that was learned using the incidental approach which is contextualized. However, students should understand a large number of the words in the text (Nation, 2004). On the contrary, incidental learning focuses on learning words by e.g. guessing the words' meaning from the text by reading. This is a very useful way but it is sometimes difficult (Ma, 2009). So, students should be careful while using it and they should know the problems that may occur (Schmitt, 2008). There is another tool that can be used in incidental learning which is glossing. This way is more beneficial than guessing (Nation, 2001), as it gives students the right meaning and draws their attention to the words that they should learn, helping them learn better. This was seconded by Hulstijn (1992) who found that in incidental learning, the vocabulary acquisition rate is low. Besides, this way helps students to recognize new words but does not lead to productive learning (Ma, 2009). Similarly, it was said that to understand a text, students need to recognize 95% of the words in the text (Nation, 2001), which shows that a high level in the language is necessary. Therefore, this tool would be more appropriate for advanced level students (Bisson, van Heuven, Conklin, & Tunney, 2013).

Incidental learning should be used with other learning approaches to enhance effective learning. Schmitt (2000) claimed that using the explicit and incidental ways in teaching the most frequent words will provide a good result, since explicit learning increases the breadth of knowledge and incidental learning improves the depth. Likewise, Schmitt (2008) argued that it is beneficial to combine incidental learning with intentional learning since these two approaches complete each other, and this helps to retain the word that students have learnt explicitly.

2.1.4.2. Formal, in formal and non-formal learning

Learning vocabulary can be formal, informal or non-formal. Cross (2007) differentiated between formal and informal learning. He claimed that formal learning happens in official schools and courses and this learning depends on specific schedules and

curriculums. While, informal learning is not official and can happen intentionally or unintentionally, also it does not have specific curriculums. Moreover, he confirmed that there is a relationship between informal and formal learning and teachers can utilize some informal strategies in a formal class such as games. In addition, informal learning was defined by John Dewey (1986) as the information and knowledge that students learn through their experiences. This is related to lifelong learning, which could be considered the most important base for modern theories.

According to Cedefop (2009), there are different meanings for formal, non-formal and informal learning. Formal learning is learning that occurs in an organized and structured environment (e.g. in an education setting, training institution or in the job) and is explicitly designated as learning (in terms of objectives, time or resources). Formal learning is intentional from the learner's point of view. It typically leads to validation and certification (Cedefop, 2009, p. 73). On the other hand, non-formal learning is learning which is embedded in planned activities not always explicitly designed as learning in terms of learning objectives, learning time or learning support but it contains an important learning element. Non-formal learning is intentional from the learner's point of view (Cedefop, 2009, p. 75). Whereas, the informal learning results from daily activities related to work, family or leisure. It is not organized or structured in terms of objectives, time or learning support. Informal learning is mostly unintentional from the learners' perspectives.

Livingstone (2001) gave a different definition of formal and non-formal learning. In formal learning, teachers have control, and different curriculums are used to help students acquire specific knowledge. Whereas non- formal learning comes from studying the curriculum voluntarily. Also, this learning could be incidental without referring to specific knowledge.

2.1.5. Online computer games and vocabulary learning approaches

Referring to the previous section about vocabulary learning approaches and strategies, online computer games can be considered implicit, incidental, explicit, informal and

extramural but it seems that there is a lack of studies that have investigated which learning approaches and strategies online computer games use.

Underwood, Luckin and Winters (2014) studied how technology makes learning vocabulary an easy task. The researchers stated that computer games give students the opportunity to practice vocabulary anytime and anywhere. Also, using technology in learning vocabulary makes it more meaningful and closer to students' interest and social environment. Besides, technology gives students the chance to test their vocabulary, use it, review and recall it.

Ma (2009) investigated the learning of vocabulary with a focus on the form and meaning in a program that used different tools related to computers. The results claimed that implicit, meaning-focused and explicit, form-focused learning were used by the learners. However, it is difficult to investigate implicit learning. Hitosugi, Schmidt and Hayashi (2014) found that digital games enhance learning vocabulary explicitly in the long-term memory since students can remember vocabulary that they have learnt. Similarly, Allum (2004) claimed that learning with computer exercises is explicit learning as students pay attention to vocabulary and these exercises are used to learn new vocabulary or to practice it. In this study the researcher used Nation's (2001) processes in learning vocabulary: noticing, retrieving and generating. Computer tasks give learners the chance to notice the words. In the retrieval stage, they can study the productive and receptive use of the words. In receptive exercises students choose the correct answer from a list of words or matching the word with its definition in the sentence. While, in productive tasks learners need to write the word to a given definition. In the third stage, students will be able to integrate the receptive and productive knowledge of words in different context.

It is worth mentioning that Sylvén (2004) and Laufer, & Hulstijn (2001) indicated that when using games in teaching vocabulary the term 'incidental' is used. This was confirmed by Alsayegh (2016) who concluded that incidental learning occurs when using digital games in learning English as a foreign language.

It was said that games would be considered informal learning since learning here happens unintentionally. Rankin, Gold, & Gooch (2006) stated that the use of MMORPGs is informal learning that helps students to practice language in a real-life context. In addition, Kahila and Saarikoski (2014, as cited in Väisänen, 2018) added that lifelong learning in pedagogical research is very important. Additionally, video games could be a lifelong learning tool and through them children can acquire a great number of skills.

Moreover, games may be considered naturalistic learning, self-directed naturalistic learning, or out-of-class learning (Benson, 2001; Benson, & Reinders, 2011; Lamb, 2004; Yi, 2005). However, Sundqvist (2009, p. 25) mentioned the term "extramural language learning" which gathers all the strategies that refer to video games. This new term means that intention is not needed to learn the language. This shows that learning happens outside the class and without instructional context which means in an informal setting. Linderoth and Bennerstedt (2007) stated that extramural learning happens when players play computer games. Also, that students are motivated to play, and they use English in written and spoken forms. In regards to this, Thorne (2008) used the term informal and extramural context. It was concluded that students interacting with each other naturally while playing, helps them to learn. What is more important here that this way makes students use language receptively and productively. Similarly, it was found that students are able to use the language in a real context if they communicate in extramural environment and this motivates them to repeat and imitate the written and spoken language (Piirainen-Marsh, & Tainio, 2009). Moreover, Sundqvist and Sylvén (2012) focused on the extramural environment in playing games, and they found that extramural English increases vocabulary acquisition. It was added by Turgut and Irgin (2009) that the extramural setting encourages students to use vocabulary in non-gaming context. Peterson (2012a) indicated that online games are appropriate for formal and informal learning.

So, the following figure shows how online computer games can be related to different learning strategies and approaches.
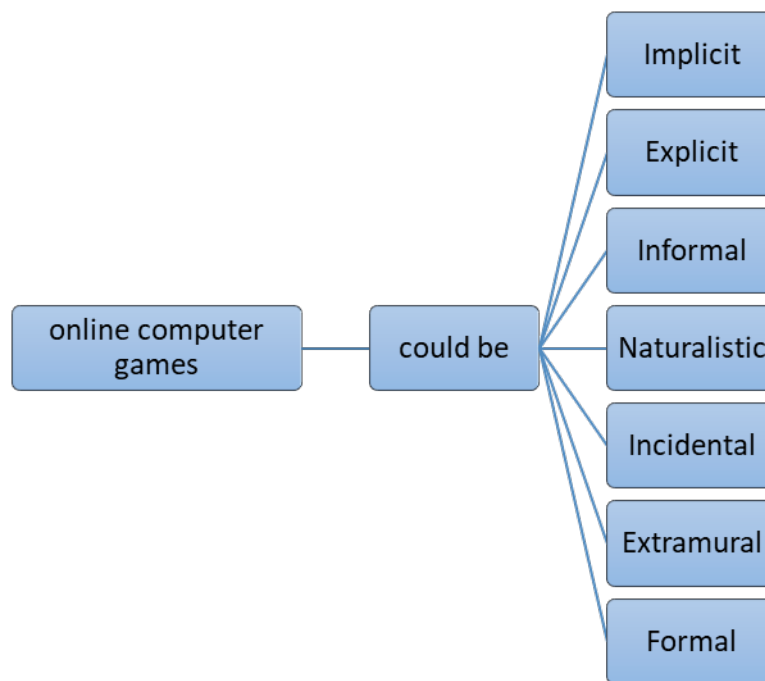
Figure 8. The relationship between learning approaches and digital games

However, the current study focuses on online computer games as explicit, incidental learning in a formal context.

2.2. Information communications technology (ICT) in Education

There is a relationship between children's achievement and using computer or software programs (Judge, 2005; Pavlas, Heyne, Bedwell, Lazzara, & Salas, 2010). People who are surrounded by and interacting with ICT are better able to find different ways of learning than people who do not (Pedro, 2006). In addition, Wang, Teng, & Chen (2015) showed that using ICT causes a positive influence on students as it increases their motivation to learn and it helps them to look and to listen which in turn, means more interaction and more learning. Furthermore, applying ICT in the classroom creates a friendly and relaxed atmosphere. As stated by Morton (1996); using computers in the classroom is very important because computers do engage students in the learning process, as they can test new knowledge, communicate with each other, and gather information easily. The importance of technology is not only in the classroom but also that it gives students the ability to solve problems that they are faced with. Moreover, children who are already accustomed to playing

computer games will already be motivated by their presence in the classroom. Above all, those children have the technical intelligence and their parents often depend on them to deal with technology issues at home (Hazlett, 2004). In addition, using computers in the classroom affects the learning of English vocabulary positively (Segers, & Verhoeven, 2003).

It is evident that students prefer to learn with computer games, and they positively enhance ELT learning (Turgut, & Irgin, 2009). Also using computer games helps children learn better because they develop children's fine motor skills, concept learning, alphabet recognition, counting skills, cognitive development and self-concept (Agudo, Rico, & Sánchez, 2015). They help learners to get ready for the future because they connect learners with real life activities (Al-Shahrori, 2007). The use of ICT has been studied by governments, experts and practitioners (UNESCO, 2008), and it was agreed that it can play a very important role in developing education and reforming it.

There are a number of factors which affect teachers' utilization of computers as a tool of teaching in the classroom: Spingytė and Jasnauskaitė (2016) showed that teachers are somewhat reluctant to apply ICT to their lessons. However, there is a relationship between playing computer games and using them in the classroom. Teachers who play computer games at home apply them in the classroom more than the teachers who do not. Teachers who below 45 years of age play computer games at least once a week; whereas, older teachers have never played computer games (NFER Teacher Voice Omnibus, 2009), and they do not believe in the advantages of using computers in the classroom (Pavlou, & Vryonides, 2009). Moreover, male teachers play computer games more than females and they use computer games in the classroom more than females. This comes as a result of males' seeing the usefulness of using computers in the classroom more than females as it is easy to use and students like it (Spingytė, & Jasnauskaitė, 2016). Also, teachers who teach elementary classes see more advantages than the secondary teachers do in using computer games in class (NFER Teacher Voice Omnibus, 2009).

Researchers such as Awan (2011) argue that teacher training lectures on using ICT in the classroom and how to use it influences teachers' use since they give teachers a positive perspective and increase their confidence in using ICT. Similar results were found by Ertmer

(2005) who showed that teachers' beliefs are affected by three factors. Firstly, the lack of access to technology or training. Secondly, the 'beliefs' about what is considered effective professional practice in teaching. Finally, are the reasons and purposes which motivate teachers to use technologies. See Figure 9 about barriers for using technology in the classroom that The British Educational Communications and Technology Agency study (BECTA) came to:
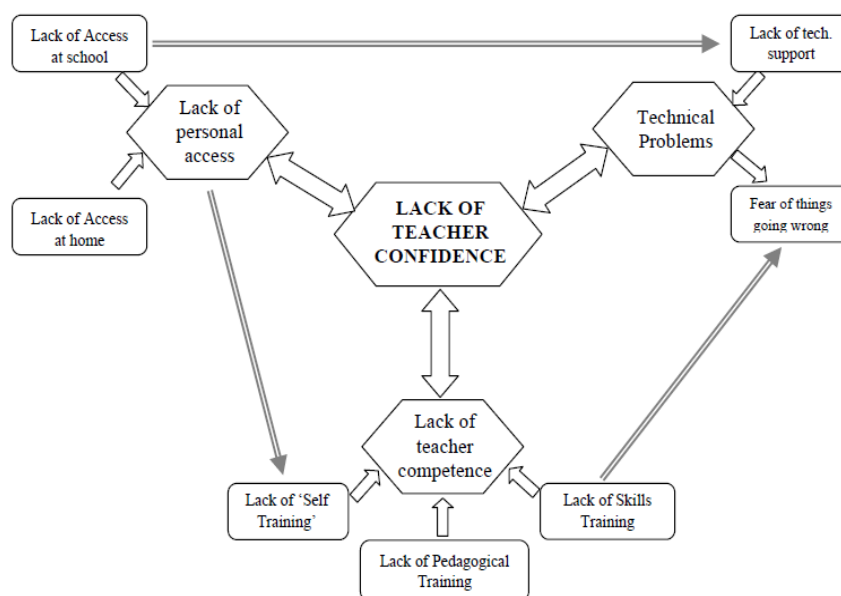
Figure 9. Relationships between Confidence barrier and other barriers (Becta, 2004, p. 21)

This figure shows the real reasons for not using ICT in the classroom which are; the lack of access to technology, lack of skills, pedagogical reasons and self-training. So, teachers are not confident enough to use technology and as a result they reject using it in their teaching. Also, the results found that the lack of teachers' confidence in using ICT in their teaching comes as a result of the lack of training time, lack of pedagogical training, and the training courses that do not fulfil the teachers' needs (Becta, 2004).

On the other hand, according to Smaldino, Lowther and Russell (2009), computers have multi-tasking tools in teaching and learning. Also, it plays different roles in language learning as; a teacher, a tutor, a tool, an exploratory environment and a communication media (Means, 1994). Computers are one of the key instructional technologies used in education

which help teachers and students because they are considered effective machines that help in carrying out many tasks continuously such as writing and saving data (Smaldino et al., 2009). In a previous study by Newby, Stepich, Lehman and Russell (2006), a computer can play the role of a teacher giving students instructions to follow in order to complete a given task. It can also evaluate students' learning by giving them quizzes or activities to do, then it provides students with feedback about their work. Teachers should plan instructions for the activity in which the computer is used to make the learning process beneficial for students. In addition, teachers should be aware of the different usage of the computer before using it in the classroom (Means, 1994).

Although the previous studies have explained the importance of using the computer in the learning environment and their popularity among teachers, some teachers have a negative opinion about them since computer games are more appropriate for only two types of learners. Younger children or elementary students, and for college and professional students in business courses (Alessi, & Trollips, 2001, p. 270).

However, the children of today have different ICT skills from the older generation as claimed by (Prensky, 2001b).

2.2.1. Our today's students

It is worth mentioning that children today are different from children in the past as they live with technology, and their characteristics have changed. A new generation of tech-savvy' learners has appeared (Bennett, & Maton, 2010, p. 322).

Since those children were born into a world full of technology, they behave, think and even learn in different ways than the older generations have done (Oblinger, and Oblinger 2005; Prensky, 2001a). Besides, some claim that they are addicted to technology and they have a high dependence on electronic media in their lives (Roberts, 2005). As a result, Prensky (2001b, p.1) said that "our students have changed radically. Today's students are no longer the people our educational system was designed to teach". Moreover, McLuhan (1997 cited in Prensky 2001b, p. 46) that:

> To educate the 'turned-on' teenager in the old mechanical style is like asking a three-year-old who has just learned English to talk pidgin-English or to use a heavy Scottish brogue. These things are not in his environment and therefore not cognizable.

Researchers have used different terms to describe the new generation. According to Howe and Strauss (2000), they are called "Millenials". Two terms were used by Prensky. The first term "digital natives" (2001b) because they "have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (p. 1). The other term applied by Prensky (2001a, p. 46) is "Games Generations" to refer to "native speakers of the digital language of computers, video games and the Internet". "Net Generation" also appeared to be a common term in this field (Oblinger, 2003; Oblinger, & Oblinger, 2005; Tapscott, 1997, 2009). Moreover, Jorgensen (2003) used two terms "Generation Y" and the "Digital Generation".

On the other hand, people who were born before the technology revolution and before 1980; are called "digital immigrants" (Helsper, & Eynon, 2010; Prensky, 2001a). It is said that those people "were not born into the digital world but have, at some later point in their lives, become fascinated by and adopted many or most aspects of the new technology" (Prensky, 2001a, p. 46). Those people do not feel that technology is part of their lives and they feel uncomfortable using it. However, teachers today are digital immigrants and their students are digital natives, so teachers find difficulties in teaching them as Prensky (2001b, p. 2) claimed that they "… struggling to teach a population that speaks an entirely new language". However, students also find many obstacles in learning as a result of the different generations. Simensen (2010, p. 482) said that ''the most pressing question from an educational point of view is the discrepancy between the language pupils are exposed to in the media and society in general, and the language they meet in the educational system". This means that there are two different thoughts and cultures; in and out of school where students are faced with English so there is a need to decrease the variation and the gap (Henry, 2013).

Prensky (2009) used new terms for digital immigrants since this term depends on age only. However, "digital wisdom" and "digital homo sapiens" are new terms which claim that people who are digital immigrants can have digital wisdom and this can happen by fostering their digital capabilities with their innate capacities. On the other hand, White and Le Cornu

(2011) applied the visitors and residents' term which stated that people behave differently with digital tools. With regards to motivation and context; visitors visit the Web to achieve some goals and participate less in online activities. Whereas, residents consider the Internet to be a place to interact with others, share their opinions and information and maybe also work with digital identities. In addition, this concept is a continuum. not a binary distinction since "individuals may be able to place themselves at a particular point along this continuum rather than in one of two boxes" (White, & Le Cornu, 2011, p. 10). A new concept has been developed and added to visitors and residents terminology which is "modes". This clarifies the use and behavior in digital connection as resident mode and visitor mode. Different situations and contexts may change which mode people are in at any given time (Connaway, White, Lanclos, & Le Cornu, 2012; White, Congedo, Ciorciari, & Silberstein, 2012).

Many researchers have detailed children's characteristics today (Bayne, & Ross, 2007; Bennett, Maton, & Kervin, 2008; Brooks-Young, 2005; Jones, & Shao, 2011; Oblinger, 2003; Oblinger, and Oblinger, 2005). Prensky (2001a) claimed that children are the games generation, who are '*native speakers* of the digital language of computers, video games and the Internet' (Prensky, 2001a, p. 46). Children consider computers to be their friends since they create a fun atmosphere. So, the use of digital technology has probably affected children positively (Prensky, 2001a). Moreover, Bayne and Ross (2007) argue that children are impatient and have the ability to multi-task. This is because they are affected by quick access to information and immediate feedback, so they like to learn actively instead of being passive learners (Bennett et al., 2008; Jones, & Shao, 2011; Oblinger, 2003; Oblinger, & Oblinger, 2005).

According to Prensky (2001a, pp. 51-52), this games generation of students are different from the older generation since many of their characteristics have changed and this has also changed their way of learning: students of today are born with twitch speed in which they can see movies or games with many pictures in one-minute and they can do a number of things at the same time. What is more, students prefer graphics to text, and they do not like to do things in order, instead they prefer random access. Moreover, it is important to them to be connected all the time and to be active learners. They prefer to play games and

they consider them as work. Those learners consider technology to be their friends and they like playing and learning in virtual life, they also enjoy the payoff of where if they succeed in a task, they will get a reward.

Also, they prefer a hyperlinked environment in which they feel comfortable (Brooks-Young, 2005). Otherwise, teenagers and adults have different beliefs about computers "For adults computer skills are a tool, but for teenagers using computers has become a second language" (Moore in Prensky, 2001a, p. 46). They use different parts of their brain when using a computer so "as a result of repeated experiences, particular brain areas are larger and more highly developed, and others are less so" (Prensky, 2001a, p. 44). However, students of today are active learners not passive (Prensky, 2001a). On the contrary, Walker and White (2013) argued that technology affect students negatively as they cause violence due to unsafe online access.

2.2.2. Introduction to digital games

In this section different terms are used to refer to games; computer games, video games and digital games or gamification. Also, some digital games can be played through the Internet such as online computer games and some of these games are massive multiplayer online computer games. So, digital games will be used as an overall term which contains online computer games.

It should be mentioned that a game was defined by Dempsey, Haynes, Lucassen, & Casey (2002, p.159) as "a set of activities involving one or more players' with not only 'goals, constraints, payoffs and consequence' but also 'rule-guided and artificial' aspects and 'competition". This shows that games have players, rules and goals. And in any game players play to win the game by overcoming its challenges and conflicts (Smed, & Hakonen, 2003).

Many researchers (e.g. Gee, 2007; Rankin et al., 2006) applied the term video games, although many others used computer games such as (Begg, Dewhurst, & Macleod, 2005). On the contrary, some researchers found the term gamification to mean utilizing games in a non- gaming context, and applying games as an activity (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011). Some other researchers adapted the term of serious games to refer to games that are not normally considered as such because their aim is not only to entertain but also to

provide a learning experience (Gachkova, & Somova, 2016). Additionally, Zarina and Hanafizan (2005) used the term "edutainment" integrating the words "education" and "entertainment" the two elements that digital games lead to in a learning environment.

Computer game was defined by Kirriemuir and McFarlane (2004, p.6) as a tool that "provides some visual digital information or substance to one or more players; takes some input from the players; processes the input according to a set of programmed game rules; (and) alters the digital information provided to the players", and this computer has three roles in playing those games; "coordinator" "illustrator" and "player" (Smed, & Hakonen, 2003). On the contrary, many studies disagreed about digital games that people play on a computer (Prensky, 2001a, 2007). Mäyrä (2008) claimed that games refer to different kinds of games that people play, some games have been played for hundreds of years but the term digital game is new and the interest in studying this type of games comes from their global popularity and their commercial success. Tan and Jansz (2008, p. 532) claimed that "Digital games is the umbrella term for interactive games that are played on different kinds of electronic media thus encompassing computer games, video games, games on mobile phones, and games that are played on the Internet".

Despite the different names, they all have the same aims, techniques and characteristics. But there are games that can only be played using the Internet and via a computer which are called online computer games. Some of these games are massive multiplayer online games (MMOs) in which players interact with each other. In recent years, massive multiplayer role play online games (MMRPOGs) have appeared. These games are played online and players from a variety of countries are connected and each player has a role or "character" in the game (Thorne, 2008). However, this type of game got the attention of applied linguistics researchers who use them in learning and teaching languages such as (Peterson, 2010a, b; Reinders, 2012; Sykes, Reinhardt, & Thorne, 2010; Thorne, 2012).

As a result, this has meant an increase in the use of video games in education. and that the products develop from one year to another (Egenfeldt-Nielsen, Smith, & Tosca, 2013). Kirriemuir and McFarlane (2004) showed that 75% of children play games daily and this affects people's lives. It makes players active and encourages them to take an active role

in their playing. This makes them different from the other media that does not make them active (Juul, 2011, p. 15). But it still unclear if this causes positive or negative effects and whether children learn by playing or not (Kirriemuir, & McFarlane, 2004).

Statistics by ESA (2015) showed that digital games control people's lives and both male and females play games, but males play them more often, they spend 6.5 hours per week on this activity. It is not only children who play games but this also reaches adults with the average age of players being 35. The computer is the preferred machine that 62% of players play games on. Moreover, games are not only for fun but also 75% of parents said that they play games with their children because they think that this helps them interact with their child and form a close relationship with them. Moreover, Yee (2006) indicated that players with an age average (26.57) play MMORPGs for 22 hours per week.

The Entertainment Software Association (ESA) (2008) found that players liked to play a variety of games such as: strategy games (33.9%), Role-Playing games (18.8%), family games (14.3%) and finally shooter games (11.6%). However, these results had changed in 2017 and players were interested in different types of games. Shooter games for example had a much higher rate of interest (25.9%), Action games (21.9%), Sports games (11.6%), Role playing games (11.3%), Adventure (9.1%) and Strategy games (4.2%).

According to Chik (2012), video–game- related activities have three aspects with regards to learning foreign languages: in-game text, interaction and in-game discussions. Bartle (1996) added that players were divided into four types: achievers, explorers, socializers and killers. Two approaches have appeared with regards to the relationship between dimensions and players' style: action versus interaction, and world oriented versus player-oriented. The first type of players are achievers who act on the game. The second are explorers who interact with the game. The third is socializers who interact with other players. And finally, killers, who act upon other players (Bartle, 1996).

In order to explain online computer games' advantages in learning English vocabulary, the researcher will study the importance of digital games in education in general and in

learning English vocabulary in particular since the digital game term is more inclusive. Then the study will focus on online computer games and English vocabulary

2.2.2.1. Classification of digital games

Since their appearance in the early 1960s digital games have increased in popularity (Chatfield, 2010), and they have become part of people's lives (Crawford, 2012). These games can be classified into different types.

The sociologist and philosopher Caillois (1961, pp. 12-26) classified games into four categories: *agôn* (contest), *alea* (chance), *mimicry* (simulation), and *ilinx* (vertigo). Also, to describe the qualities of games, some may be placed into two or more categories as those mentioned fail to describe newly released games. He argued that these categories are necessary and that these features can fit into three levels: "the level of the game itself, that of the player's relationship to the game, and that of the relationship between the activity of playing the game and the rest of the world" (Juul, 2011, pp. 36-43).

The Entertainment Software Association (ESA) (2013, p. 8) classified games according to their playing subject as: action games, shooter games, sport games, family entertainment games, adventure games, role-playing games, racing games, fighting games, casual games, strategy games, children's games, flight games, arcade games and other games as distinct game genres. However, it was concluded that it is not sensible to categorize games as they did because the entertainment business differs from the game studies.

Some researchers differentiate between educational games, games for learning, serious games and vernacular games. According to Mayer (2014, p. 4) the first three terms refer to games and stimulation that aim to promote learning while the last term refers to "commercially available popular games not designed purposefully for L2 learning purposes" (Reinhardt, & Sykes, 2012, p. 32). Moreover, it is easy to distinguish between games which are made for educational purposes and those which are for entertainment (Reinhardt, & Sykes, 2012, p. 34).

Gachkova and Somova (2016) divided games into: Game-based learning which uses video and electronic games, Gamification of learning which integrates game elements and

techniques with the e-learning process, Organizational-dynamic games that teach and reflect the dynamics of organizations on three levels: individual behavior, group behavior and culture dynamic. There are also Simulation games which are used for the acquisition or training of different skills such as teaching effective behavior in the context of simulated conditions or situations; and Edutainment which presents content, designated simultaneously for education and enjoyment (the term is a combination of the words education and entertainment).

According to Prensky (2001b), digital games can be divided into eight genres. Action games which focus on movement like racing, jumping and shooting, Adventure games in which players discover the world around them e.g. pick up objects and solve puzzles, fighting games in which players fight each other in a battle, Puzzle games which focus on solving problems, Role-playing games in which players play the role of a character such as a soldier or a wizard. these games can be both role-play and action or fighting. There are also simulation games in which players build, drive or fly, Sport games in which content is the most important thing. Most of these games are action games and players play sports like football as it is realistic. Finally, there are Strategy games in which players plan for something like an army or an entire civilization against others.

Additionally, video games can be divided into nine types: sports simulations like football games, racers (e.g. car racing), adventure (fantasy games), puzzlers. In addition, beat-'em-ups which include physical movements which are usually violent actions, and shoot-'em-ups in which players use weapons to shoot and kill others. Finally, there are platformers, and platform blasters in which players torpedo objects they see in order to win (Griffiths, 1996, 1999). However, two games only can be used in education which are puzzles and weird games (Griffiths, 1996).

Finally, Reinhardt and Sykes (2012) claimed that teachers and researchers should discuss the differences between game-based learning and game-enhanced learning as explained in detail below.

2.2.2.1.1. Game-enhanced Learning and Game-based Learning

Online computer games are popular with students so, teachers have started using them in education for: games-enhanced learning and games-based learning (Reinhardt & Sykes, 2012). However, players have different gameplay experiences; some playing to learn and others learning to play (Arnseth, 2006).
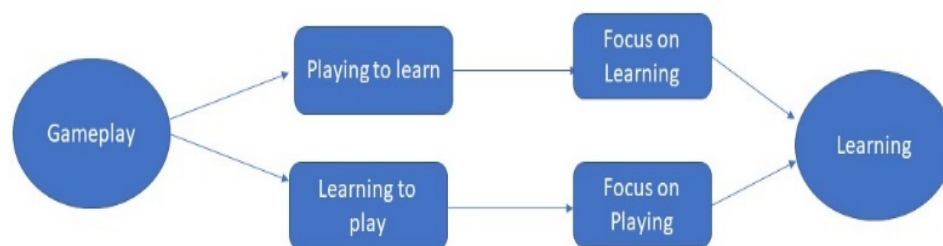
Figure 10. Players' experiences with games

Researchers like Piiranen- Marsh and Tainio (2009), and Thorne (2008) focused on Games-enhanced learning which deals with commercial games and how they help students to learn. In this type, games were considered as a learning environment. According to Reinhardt and Sykes (2012), game-enhanced learning uses entertainment games rather than educational games, which means they are less comprehensive and integrated. Moreover, they do not suit the learning process based on their content. They are also vernacular games which means students see them as inauthentic. And importantly, some games are not appropriate for institutions and the programmatic demands of the task, syllabus, and assessment (Reinhardt, & Sykes, 2012).

There are many famous online games students enjoy (e.g. *World of Warcraft (WoW)* and *Runescape*) which are vernacular games. These games have many advantages in learning. Firstly, they connect players with people who speak foreign languages which helps them to learn a language. Secondly, these games challenge students to look for solutions to problems. Finally, they create social interaction (Piiranen-Marsh, & Tainio, 2009; Thorne, 2008) which helps players to interact with others (Sykes, Reinhardt, & Thorne, 2010).

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Arnseth (2006) indicated that players who play these games learn incidentally, and they learn the English language to be able to play the games.

On the other hand, Game-based Learning uses educational games for learning a foreign or second language and students' behavior is affected by specific games (Sykes, 2010). The design of those games is very important since they should teach a language. (Holden, & Sykes, 2011).

Gee (2007) indicated that game-based learning creates deep learning, since they require players to read and write tasks on a computer screen and use different multimedia like videos, images, texts and audio (Lankshear, & Knobel, 2008; Prensky, 2001a, b). Moreover, they use definite instructions which concentrate on the content and complex language. According to Neville, Shelton, and McInnis (2009, p. 420), "the [digital game-based learning] students wrote longer essays, used more pertinent vocabulary words in the essay, and manifested a higher vocabulary to non-vocabulary ratio". This shows that this way could be one of the most important methodologies in language teaching (Hubbard, 1991), but it still needs to be studied more (Chick, 2011).

According to Prensky (2001b, p. 3), Digital Game-based Learning is a very promising strategy in learning, and it will be accepted as the norm in learning for three main reasons. First of all, this way is considered to be an appropriate way for today and future students' needs and style of learning. Secondly, it is an encouraging tool because it is fun. Lastly, it is an effective way of learning when used appropriately since it can be applied to different subjects, skills and information. In addition, in the future there will be more digital games in education, and they will be "fully online, wireless and massive multiplayer games" (Prensky, 2001b, p. 404). Also, more focus will be given to experience, communication, cooperation and human interaction. As a result, the quality of games will be higher, and they will be more encouraging.

There are many advantages of this way. To begin with, teachers or researchers can use those kinds of games to teach particular elements. Games can also be designed to find data about how learners interact with and within the games to get more comprehensive

information. Finally, this way gives learners the chance to practice the information that they have learned, which helps to develop the content of the game and encourage learners' behavior (Reinhardt, & Sykes, 2012). But the teacher here plays very important role in directing students' attention to the learning rather than to the game itself as Hanghøj (2011, p. 32) claimed:

> The findings also underline the importance of the teacher in choosing, introducing, facilitating, and assessing the use of educational games, that is in designing the overall pedagogical activities. It is only by aligning the knowledge forms of particular games with students' genre expectations that teachers will be able to set and pursue desired educational goals, which again may ensure relevant ways of translating gaming experiences into meaningful knowledge production within a formal school context.

So, what creates meaningful learning environment when using games, is how teachers introduce them in their classroom to achieve their learning aims and how they integrate them with learning to activate students' participation and to help players in sharing knowledge (Stieler-Hunt, & Jones, 2015a, b).

Boeker, Andel, Vach, and Frankenschmidt (2013) argued that learning with gamification motivates students to learn and that their intellectual knowledge will also be better. The researchers added that game-based learning gives students the chance to learn in a fun and interesting environment. Laskaris (2014) added that game-based learning depends on visual skills more than oral skills. These help learners to recall and remember words much better than only having read them and a better outcome will be the result for using games in verbal learning. Moreover, teachers agreed that gamification in the classroom reinforces students' knowledge and guides them (Lee, & Hammer, 2011). In addition, it was suggested by Lee and Hammer (2011) that learning with games makes students recognize their real power.

It is worth mentioning that good digital game-based learning depends on engagement and learning. If there is no engagement, play will be boring, and learning will not occur. Also, if there is an engagement without learning, the aims of digital game-based learning will not be achieved as Figure 11 shows.
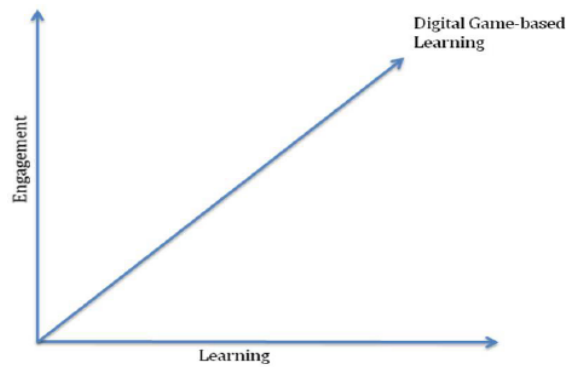
Figure 11. The relationship between engagement and learning in digital game-based learning (Prensky, 2001b, p. 150).

Therefore, when designing and choosing games for game-based learning, they should be fun and people should consider themselves players rather than students. The games should be played regularly and make players use the language. Players should want to play again and again to develop their skills, knowledge and abilities. Moreover, they should motivate students to reflect about what they learn (Prensky, 2001b).

However, many things affect the application of digital game-based learning. Companies should recognize their significant role in learning, so they can create a new market for educational games. Parents need to interact more with their children in playing games to find what is useful for them. Schools should use more games in teaching students what they want to know. In addition, it is important for teachers and trainers to show their willingness to try new ways of teaching which may be new for them but good for their students. Furthermore, researchers should be involved, doing experiments and new evaluations related to new strategies of teaching. Students' agreement should also be considered to prove that this way is useful. Student's reflection is very important in this field (Prensky, 2001a).

Digital Game-based learning uses interactive learning techniques which are said to lead to the creation of useful games. These techniques are: practice and do to learn, feedback which help learners to learn from their mistakes, having specific goals, learning by

discovering tasks and questions, role playing, coaching, constructivism, intelligent tutoring and selecting from learning objects (Prensky, 2001b, p. 157).

So, what makes digital games very useful in learning the English language in general and English vocabulary in particular.

2.2.2.2. Characteristics of good video games

Gee (2003, 2013) stated that good video games give gamers good learning. Prensky (2001a, p. 106) showed that video games are the most attractive tool, and they engage students to learn as they combine different elements:

- Games are a form of **fun.** That gives us **enjoyment and pleasure.**
- Games are form of **play**. That gives us **intense and passionate involvement.**
- Games have **rules.** That gives us **structure.**
- Games have **goals.** That gives us **motivation.**
- Games are **interactive.** That gives us **doing.**
- Games have **outcomes and feedback.** That gives us **learning.**
- Games are **adaptive.** That gives us **flow.**
- Games have **win states.** That gives us **ego gratification.**
- Games have **conflict/competition/challenge/opposition.** That gives us **adrenaline.**
- Games have **problem solving.** That sparks our **creativity.**
- Games have **interaction**. That gives us **social groups.**
- Games have **representation and story.** That gives us **emotion.**

Prensky (2001b) investigated playing educational games like *Freddi Fish, The Logical Journey of the Zoombinis, Age of Empires II* and *Starship Command* on 6 and 9 year old boys. The researcher noticed that games attracted students' attention and they spent most of their time playing them without feeling bored or tired.

Vandercruysse, Vandewaetere, and Clarebout (2012) added to Prensky's (2001b) games characteristics, how each character brings advantages to learning. Fun gives

enjoyment, pleasure and motivation. Rules gives structure, goals and objectives which lead to motivation and stimulation. Interaction/interactive causes active players who interacting with others. Outcomes and feedback give learning and information about progress. Problem solving/competition/challenge benefit adrenaline, excitement, creativity. And finally, representation/story/fantasy/context which cause emotion (enthusiasm) and stimulation.

Jones (1998, as cited in Kirriemuir, & McFarlane, 2004) added that there are six characteristics for good games: learners can complete them; players can focus on them, they have clear aims, they involve players, they give players control during play and players' feeling of self disappears in games but after finishing them the self reappears. Moreover, the feeling of time changes during game play.

Sykes and Reinhardt (2013) defined five aspects in video games related to learning languages, goals, interaction, feedback, context and endgame or motivation. Although, these characteristics have been described by different researchers in more detail (e.g. Gee, 2008; Prensky, 2001b; Vandercruysse et al., 2012). Sykes and Reinhardt added the endgame or motivation.

Goals are the first thing that players should think about since there is a task that the player should complete in the game. This activity or task concentrates on learning languages in a realistic environment and makes students responsible for their own choices which leads to improvement in the game since the tasks in learning languages are mostly ineffective. This can be changed with something called goal orientation. According to Sykes and Reinhardt (2013, p.20), "goal orientation becomes a dynamic, negotiated, and continuous process, better understood as goal orienting, as a player constantly reassesses abilities, risks, challenges, and rewards while playing". Moreover, in order to achieve the task objectives and complete them, players ought to have good knowledge of the L2. In addition, players set obvious goals and rethink their aims at a different time (Gee, in Reinders, 2012).

Interaction is one of the most important factors which helps learners to learn languages. So, good games should foster the interaction of players like the multiplayer games, in which players from a variety of places connect with each other online. However,

Sykes and Reinhardt (2013, pp. 42-43) argued that "interaction is a function of good interactive design and that it can be promoted through immersive experiences, ergonomic interfaces, and discernable and integrated choices, as well as by connecting the game to the outside world". It is said that interaction is affected by three main things: the context of the games, the players who play them, how they take advantage of the interaction, and how games are applied to learning.

Interaction is very important for language acquisition (Krashen, 1985), and it may be an interpersonal or intrapersonal activity. The first consists of face to face and electronic interaction between people or between people and a computer. The other refers to the interaction that happens in our mind (Chapelle, 2001). It is said that the interaction in the foreign language fosters students' understanding of the words' meaning (Pica, 1994), increases noticing (Schmidt, 1990), and motivates output (Swain, 1985). Finally, Gee (in Reinders, 2012) found that video games create a relationship between playing, learning and social interaction. One of the most important experiences that players get from playing is the human-human relationship (Piirainen- March, & Tainio, 2009). Peterson (2012a) in his study about MMORPG players showed that gamers tried to control their interaction and to play an active role in their games. In addition, they use different discourse management strategies to ease output cohesion. Moreover, players confirmed that games give them the ability to have fluency practice.

On the contrary, Choi and Kim (2004) indicated that interaction consists of two types. Personal (goal, operation and feedback), and social interactions (communication place and tools). If the player interacts socially with other players who are playing online with them and personal interaction with the system, they will gain the optimal experience. Also, those players will have loyalty toward the games that they play which makes them play again and again as explained in figure 12 below:
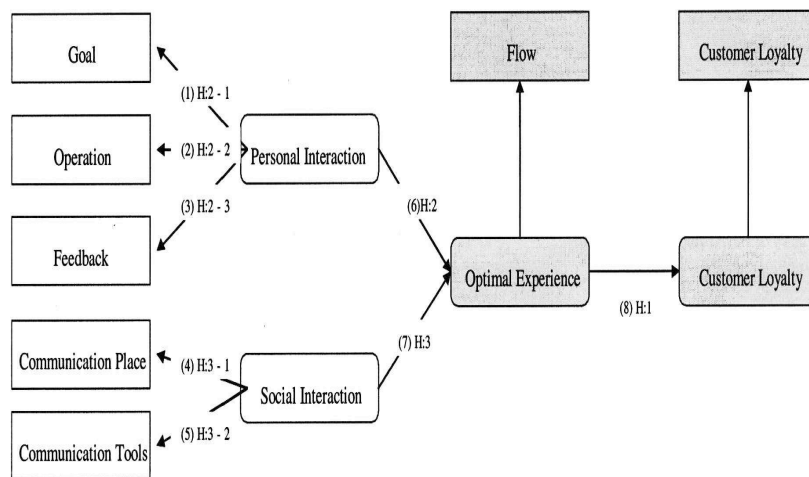
Figure 12. The factors that affect people playing (adapted from Choi, & Kim, 2004, p.15)

This idea is clarified more by Gee (2003) who claimed that players in each game have their own goals and practices. They set up communities where players can play, discuss, share and associate with other players who think in the same way. In regards to social interaction, group members can also improve their language skills since this gives players the power to write, read and review. These groups were called affinity groups (Gee, 2003) whereas, Apperley and Beavis (2011) called them paratexts in which people are either consumer or producer. This encourages players to use game text as a tool of learning at different levels. Furthermore, Leppänen, Pitkänen-Huhta, Piirainen-Marsh, Nikula, and Peuronen (2009) showed that learners usually use English to communicate with each other on web pages even if their first language is not English.

With regards to social interaction, to benefit from learning a second language with digital games, players should be willing to communicate and to respond because no response means no result. Similarly, willingness to communicate affects learners' language skills positively because players who play games and actively interact with other players achieve high language proficiency (Reinhardt, & Wattana, 2012).

Moreover, games reduce obstacles and help students to interact. It is indicated that input in L2 influences the acquisition of the second language (Ellis, 2003). Willingness to communicate is what makes the interaction with the input. In language learning willingness to communicate (WTC) is defined as "readiness to enter into the discourse at a particular

time with a specific person or persons, using a L2" (MacIntyre, Clement, Dornyei, & Noels, 1998, p. 547). Additionally, it was found that it has an impact on learners' engagement in communicating in the second language (Clement, Baker, & MacIntyre, 2003; Yashima, 2002). Kang (2005) added that without WTC students cannot achieve proficiency in L2 since proficiency can only be achieved by communication and use of the language (Swain, 1985). MacIntyre et al. (1998) argued that WTC is affected by situational influences (Layers I, II, III) and enduring influences (Layers IV, V, VI). However, when students move from one layer to another, they will have more control in their communication.
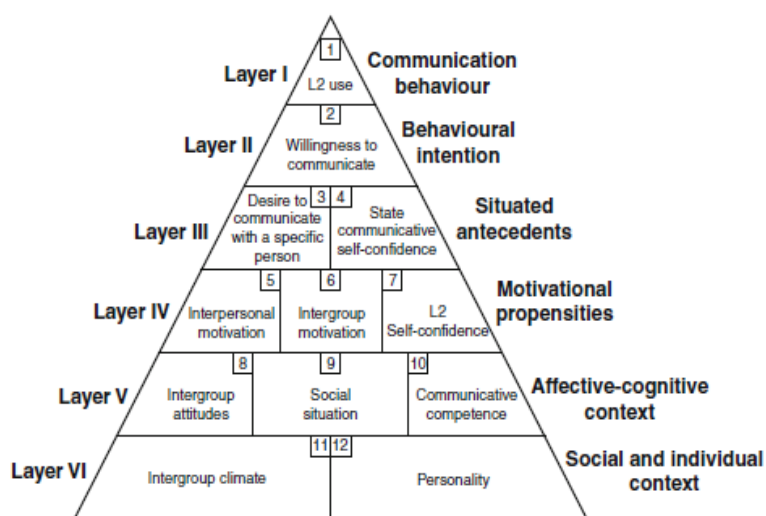
Figure 13. Influencing of WTC in learning language (MacIntyre et al., 1998, p. 547)

MacIntyre, Baker, Cle´ment, & Conrod (2001) showed that students who are more active in using the language have the chance to communicate. This means that they are more willing to communicate and practice the language which leads to fluency (Derwing, Munro, & Thomson, 2008). It was shown that games like (massively multiplayer online role-playing games "MMORPGs") are the best tools in increasing students' willingness to communicate as they are an entertaining and engaging tool. Also, they reduce students' anxiety, they create an authentic environment and social interaction which are very important to communication and to acquiring the language (MacIntyre et al., 2001).

The best game type that increases the interaction is MMORPGs (e.g. *World of Warcraft (WoW), Call of Duty* and *Minecraft*), Although they are vernacular games so tasks

within them should be designed very well to achieve the learning goals, it is claimed that these types are very useful in learning L2. Peterson (2010a, p. 432) said that:

> The presence of native speakers creates the conditions in which communication problems may occur, providing opportunities for learners to negotiate meaning. Text and voice chat provide real-time feedback and the performance of text coupled to the availability of scrolling facilitates monitoring, a focus on form and the resolution of communication problems.

Also, different types of interaction were explained related to games and learning such as: cognitive, functional, explicit, and cultural interactivity. The first refers to the mental interaction that happens in the player's mind, the second happens when gamers interact physically within the games. Additionally, explicit interaction is the harmony between games and players (Sykes, & Reinhardt, 2012).

The most important element of a good game is feedback. It is crucial in learning L2 to receive quick feedback as Sykes and Reinhardt (2012, p. 60) noted that "Feedback delivered in this way is meaningful to the player because it is immediately relevant to the task at hand, and the skills learned are critical for moving forward and ultimately reaching the endgame point". Gee (in Reinders, 2012) added that games give feedback and always test players to make sure that they are ready for what is coming. Norman (1994) in an old study showed that good games are challenging, motivating, give direct feedback, direct engagement, provide a high intensity of interaction and have specific goals. The most important thing in playing is to get quick feedback (Väisänen, 2018). In addition, Whitton (2012) argued that as well as the feedback given when mistakes are made, feedback gives players hints or clues in order to achieve the task. Moreover, Gee (2007) agreed with Väisänen (2018), and Norman (1994) that good games, give information and feedback immediately on demand as Barbara Chamberlin, project director at the New Mexico State University Learning Games Lab said "Games offer immediate feedback, you can see your progress, you can try something and be frustrated but later learn more… that's why game play is so engaging to us" (ESA, 2015, p. 4).

Games provide players with their level, time, and their credits. However, rewards or failure are also types of feedback, in which gamers know if they need to repeat the level because they have to develop their knowledge, or they get rewarded to move on to the next

level. The death of the gamer character in the game is the most common feedback which means that players need to do this task again in order to complete the level (Sykes, Reinhardt, & Thorne, 2010). Teachers or instructors can give comments at any time instead of tests or assignments as it is said that "innovative technologies, including digital gaming environments, offer a solution to many of the challenges of giving L2 pragmatic feedback by offering scaffolded, just-in-time, meaningful, and individualized feedback" (Holden, & Sykes, 2013, p. 156). Some of the commercial or vernacular games give useful feedback related to language learning so teachers should be careful to achieve this significant rule (Sykes, & Reinhardt, 2012). Purushotma, Thorne, and Wheatley (2008) added that these types of feedback not only help students to improve their skills, but they also decrease students' anxiety in learning compared with traditional classrooms.

The context is formed of the "game narrative" and "context of play" (Sykes, 2013, p. 32). In fact, "Game narratives, characters, and communities can be especially powerful for developing second language literacies both in and around a game" (Sykes, 2013, p. 32). It is said that in the game's context, gamers are encouraged to play if a game's narrative is interesting. However, the playing context is more important than the game context since it is where players have gameplay experience and they can create their own narrative. This means that it "becomes more important than designed narratives, as they provide players with a strong sense of agency" (Sykes, & Reinhardt, 2013, p. 79). This can be found a great deal in multiplayer games in which gamers have control and their actions affect the game's progress.

The last element is the endgame or motivation in which consists of different aspects such as goals and outcomes, challenges, and a good story in order to give players a useful experience. The endgame is where players are challenged, and gamers use their play time in a positive way and motivate themselves to play (Sykes, & Reinhardt, 2012). However, Sykes and Reinhardt (2012) used the term motivation instead of endgame. Motivation means that learners have the desire to use the language and to contact with its culture. Moreover, motivation can be intrinsic or extrinsic.

Applying games in the appropriate way in education could be the best solution for students' disinterest and inability to learn as they motivate students and enhance their

learning. As Jayalath and Esichaikul (2015) added that without motivation, students will not be able to learn the language successfully so teachers could use game dynamics, game mechanics, and game elements to increase students' engagement and increase their learning. In particular, online games capture students' attention in learning in order to win, even if they fail, they repeat the game until they win and learning could also happen (Hammer, & Lee, 2011; Muntean, 2011). As Fogg (2002) mentioned, motivation plays a very important role in learning, but motivation and ability need a trigger to help learners complete their work. So, it is important to find something that encourages students to learn like gamification.

According to Becta (2001), motivation in games comes from the feedback, challenges and goals which are not easy but not impossible to achieve. This leads to players being able to solve their problems and play for fun. Moreover, motivation makes students cooperate with each other, using scaffolding in learning, competing and interacting with other players.

Hammer and Lee (2011) and Muntean (2011) showed that gamification stimulates learners to learn. Video games create intrinsic and extrinsic motivation. The first means interesting and motivating factors can be found during an action, like reading in video games whereas the second refers to the external reasons for doing an action like rewards or punishment (Ryan, & Deci, 2000). Intrinsic motivation is the internal desire to do and complete a task. While extrinsic motivation depends on external encouragement by using rewards like money and good grades awards (Ryan, & Deci, 2000). According to Shneiderman (2004), students' motivation increases by using games because they become more encouraged to learn using the challenging tasks that the games provide. Teachers could combine game elements and activities to stimulate learning. Moreover, video games are considered an intrinsic motivational tool since the act of playing in general is encouraging and motivating (Ryan, Rigby, & Przybylski, 2006). Concerning the psychosocial factors that influence learning, it has been mentioned that games can encourage learners who have a lack of interest or low confidence (Klawe, 1994).

To create a good learning environment both kinds of motivation need work together to promote learning by using games techniques. This also influences learners' behavior (Flatla, Gutwin, Nacke, Bateman, & Mandryk, 2011). Tan and Jansz (2008) pointed out that

the use of digital games is increasing year after year and different aged students play them. They play a great role in capturing some games categories like fantasy; rules; sensory stimuli; challenge; mystery; and control. And they insisted that gaming is an emotional experience, so people are motivated intrinsically to play and to win. Moreover, games should suit players' interest to motivate them.
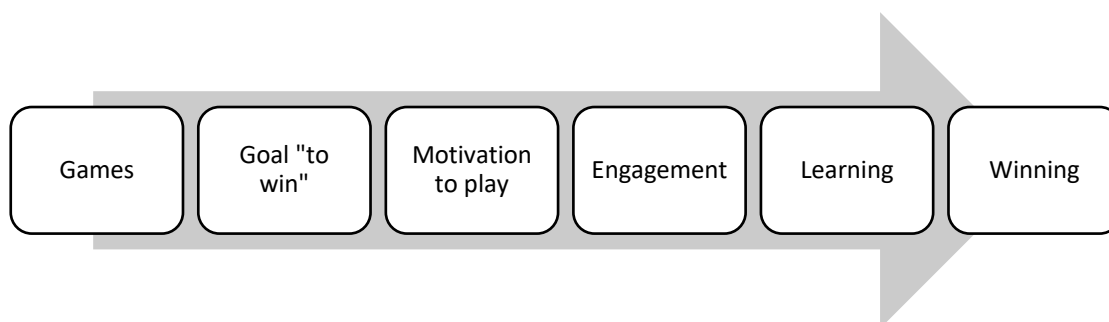
Figure 14. What makes learners learn by using video games.

As shows above, games motivate students to achieve their goal (to win the game), and this could not happen without learning. Mäyrä (2008, p. 132) claimed that there are different factors that motivate gamers to play again and again. In MMORPGs, players like to compete with others, so this motivates them to continue playing. Also, in multi-user domains (MUDs) they like to discover the game, the socializing potential and the possible imposition on others. Whitton (2010, pp. 38-39) suggested three factors that motivate students to play games in their leisure time. First of all, the mental stimulation which challenges them to play. The second is that games engage gamers in social interaction, so they compete and collaborate with others. Finally, games help learners to achieve their physical goals like doing exercises. On the other hand, she found that the main reason for playing a game is to break up boredom and to facilitate a social situation.

Gee (in Reinders, 2012, pp. Xii - Xiii) argued that video games focus on well-ordered problems and good players will have the tools to solve them. It is very important to know that notes and instructions are crucial in learning any language and vocabulary acquisition is affected a lot by explicit instruction (Blake, 2011). In addition, Malone (1980) claimed that games should be enjoyable for players to get great experience while playing. Prensky (2001a) argued that when a challenge appears in any game, players try to find a solution for it. So,

with great pleasure, players work hard to solve problem and to learn a great deal. Moreover, video games help students to learn by doing and they provide profound meaning as they focus on performance and actions (Gee, in Reinders, 2012).

Which means that at each new level, players are engaged in new problems that defy the skills and the experience that they achieved from the previous levels. Engagement in games increases learning language, as players learn the language for playing rather than for learning the language. This leads to incidental learning. So, if video games are used for educational purposes, they should be interesting in order to engage students to play and learn (Reinhardt, & Sykes, 2012). In addition, Deng and Hu (2007) said that learning with machines helps students to learn since humans like interaction with machines rather than face to face. Also, multimedia means more engagement for students because multimedia and machines create an exciting experience for students and result in them experiencing what they learn not in simply acquiring the information (Hoogeveen, 1995). Whitton (2012) showed that video games encourage players to practice scaffolding. This agrees with Gee's (in Reinders, 2012) idea that this teaches students how to solve problems. And when the game level becomes higher, the difficulty increases, and players become more independent.

According to Whitton (2012), students should be engaged in the game to play it. This agrees with Gee (2003) who stated that engagement decrease gamers' fear in learning with playing. Games help them to be active and learn effectively. Another characteristic for good games as listed by Chik (2012) is to be "interesting". This the main thing that makes learners prefer to play commercial games rather than educational games. Moreover, if games are interesting, they increase players' engagement to play and to learn. Engagement could happen in many different ways beside those listed above. In addition, "games should tell stories" to keep players interested as Gee (in Reinders, 2012, pp. Xii - Xiii) said:

> They use narrative in two ways to create engagement. They often have stories that make clear why the players are doing what they are doing and what it means. And they allow players to create their own stories through the consequential choices they have made in the course of gameplay.

Words can be associated with actions, images and conversation. This helps students to learn vocabulary as it is easier to learn the language by using concrete materials (Gee, in Reinders, 2012; Reinhardt, & Sykes, 2012).

Prensky (2001b) added that digital games engage students to play and learn because of their characteristics. They are fast, have lots of visual images and graphics with several choices. Players play against the computer or real people from different places at any time. They are challenging games, and the most important thing is the feedback which plays a main role in engaging students.

Whitton (2010, pp. 23-27) presented the games characteristics as the following: competitive "the goal is to achieve an outcome that is superior to others", challenge "tasks require effort and are non-trivial", exploration "there is a context-sensitive environment that can be investigated", fantasy "existence of a make-believe environment, characters or narrative", goals "there are explicit aims and objectives", interaction "an action will change the state of play and generate feedback", outcomes "there are measurable results from game play (e.g. scoring)", people "other individuals take part", rules "the activity is bounded by artificial constraints", and safety "the activity has no consequence in the real world". She insisted on the importance of interaction and feedback in using games in learning. Interaction helps students to test their understanding, and feedback identifies the area of improvement. Juul (2011, p. 1) added a new character for digital games which is the 'half-real' (or alternatively 'half-fictional') nature of digital games by showing that players follow real rules in the fictional world.

Salen and Zimmerman (2004) also wrote about very similar characteristics for good games and what players could benefit from: sensation: game as sense-pleasure; fantasy: game as make-believe; narrative: game as drama; challenge: game as an obstacle course; fellowship: game as a social framework; discovery: game as uncharted territory; expression: game as self-discovery, and submission: game as masochism.

According to Garzotto (2007), online computer games can be a very effective tool in learning languages if the content, enjoyment and social interaction work together. If one of the characteristics is missing this will influence the effectiveness of the game as shown in figure 15. However, Fu, Su, and Yu (2008) focused on measuring the level of enjoyment that games should have by using eight items: concentration, goal Clarity, feedback, challenge, autonomy, immersion, social Interaction, and knowledge improvement.
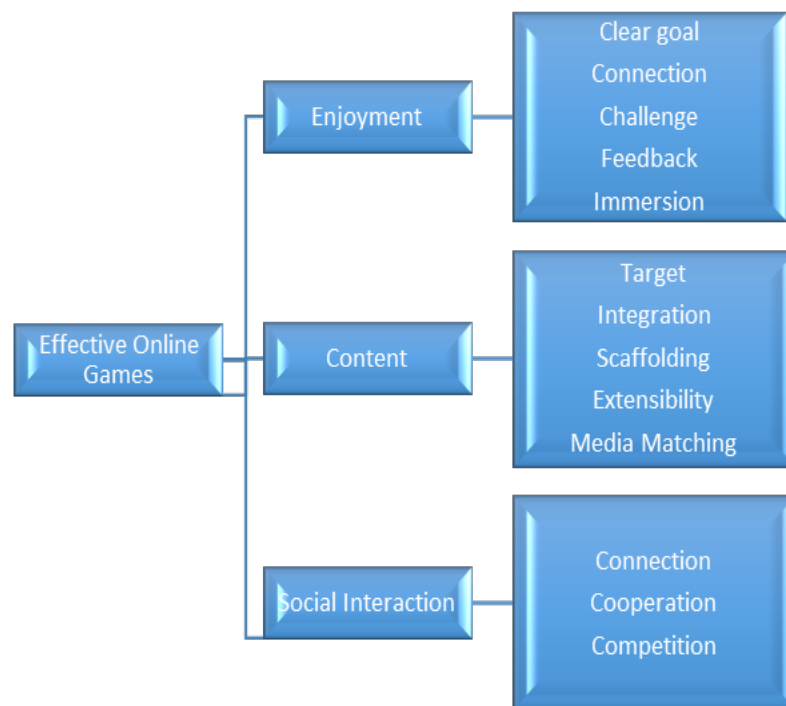
Figure 15. The characteristics of effective online games modified from Garzotto (2007).

What really makes video games a very good tool in education is that games decrease the cost of failure so "players will explore, take risks, seek alternative solutions and try new styles of playing and learning" (Gee, in Reinders, 2012, p. Xii). Whitton (2012) agreed with Gee (in Reinders, 2012) that games give players the chance to re-attempt which shows that failure is not an important matter. this decreases the anxiety of students to play and to learn (Purushotma et al., 2008). Besides, it increases students' knowledge by collaboration and competition with other players or with the game itself (Gee, in Reinders, 2012).

2.2.3. The design of a good game

According to Holsapple and Wu (2008), the usefulness of online games is affected by the quality of the games; the websites' quality, security and design; students' attitude towards playing; students' willingness to play and the easy use of online games on the website.

It is worth mentioning that the structure of implementation and the plan that teachers use should be integrated into classes, as they are more important than the tool. Good learning results come from the appropriate application of strategies (Kappers, 2017). As Hwang, Wu,

and Chen (2012) stated, games' design is also important for good learning as Lee and Hammer (2011) said "A well-designed gamification system can help players take on meaningful roles that are fruitful for learning" (p.4).

However, teachers and students should be included in the survey to get more information about the content which is designed by the game companies (Entertainment Software Association (ESA), 2007). It is important to note that gamification should be improved to be very useful for schools. This can only happen if the game designers and programmers are more careful in designing games. It is said that good games should provide value, this should be assessed to see whether or not they achieve the goals that they were created to achieve (Lee & Hammer, 2011). Moreover, there are some principles that should be taken into consideration when making and designing video games for foreign language learning (Purushotma et al., 2008):

- Focus on the failure design more than the success since success is boring and failure is interesting. When students fail at a task, they are motivated to overcome it. This makes failure, fun and lead to success after understanding the reason and solving the problem (Wright, 2003). The feedback in games give information about where they can start working to achieve success. This also decreases students' anxiety.

- Concentrate on the meaning first, then the form of the game.

- The most important thing that the game's elements should contain is "playful spirit".

- The terms and linguistics information shouldn't be the main part of the game, they should be a material which supports gameplay.

- The content of the game ought to be arranged around the activity.

- New concepts and information need to be presented alongside other content to help students to get used to and understand them before asking them for difficult answers.

- Students should be assessed during the tasks regularly and not only to see their production in a specific activity.

- Look for all the available platforms.

- Students need to be given the freedom to spend more time on task they like. Instruction should guide students to continue playing their preferred game.

- The characteristics and roles that multiplayer games provide for students should be expressive and have a significant meaning.

According to Salen and Zimmerman (2004), digital and non-digital games are similar. This means that the rules in both of them are to limit player action, explicit and unambiguous, shared by all players, fixed, binding and repeatable. But it is more complicated to identify the rules of software or digital games. Three models will clarify the rules of digital game: Constitution rules which are the actions that players take, Operational rules; players' behavior and attitude during playing games and implicit rules that have unstated assumptions of the game's platform. Moreover, when studying games, three aspects should be investigated: rules, play and cultures.

Gee (2008) argued that good video games should be well-designed and good for learning. This can be seen if the games have particular aims and objectives, give feedback, turn the information to new situations based on the feedback, help players to learn individually or with other players, and give different explanations which are open to examination.

Hunicke, LeBlanc, and Zubek (2004) argued that the integration between games' designers and players shape the game experience which the MDA framework based on. This is very important for designing games. There are three components for this: mechanics, dynamics and aesthetics. The mechanics that make up the game, as well as the more temporal effects for the nature of players' experiences and influences on the game, mean the rules that form the games and that make players interact. Dynamics refers to the behavior of players with regards to contact between the games' mechanics and players. And this arouses players' reactions when they play like team work spirit "aesthetics". However, if the aesthetics part

has not been achieved, designers may find some problems in the mechanics or dynamics parts.
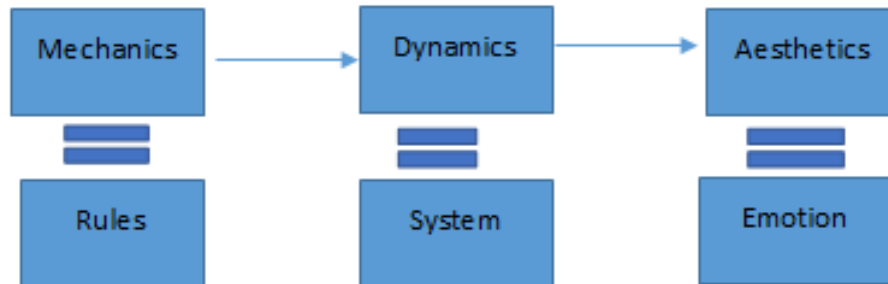
Figure 16. The games components that help in designing games

Moreover, the aesthetic part deals with the factors that make games fun and interesting. Which are:

1. **Sensation:** Game as sense-pleasure.

2. **Fantasy:** Game as make-believe.

3. **Narrative:** Game as drama.

4. **Challenge:** Game as an obstacle course.

5. **Fellowship:** Game as a social framework.

6. **Discovery:** Game as uncharted territory.

7. **Expression:** Game as self-discovery.

8. **Submission:** Game as pastime (Hunicke, LeBlanc, & Zubek, 2004, p. 2).

However, designers think about games' mechanics and dynamics first, then aesthetics whereas players see it differently from the other side as Hunicke et al. (2004, p. 2) stated:

> From the designer's perspective, the mechanics give rise to dynamic system behavior, which in turn leads to particular aesthetic experiences. From the player's perspective, aesthetics set the tone, which is born out in observable dynamics and eventually, operable mechanics:
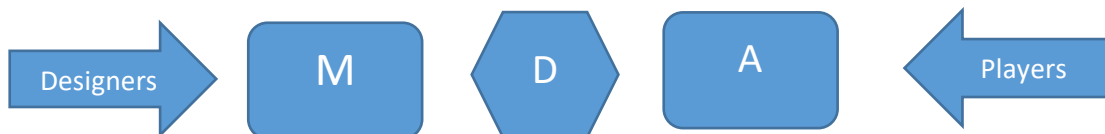
Figure 17. Mechanics, Dynamics and Aesthetics framework adapted from Hunicke et al. (2004)

Games are related to emotions and goals. Students have a goal "to win". So, they start playing to achieve this goal. This leads to achieving the mechanics, dynamics and aesthetics features. Also, goals are influenced by players' identity, "social identity" and "multisession context" as shown in Figure (18) below:
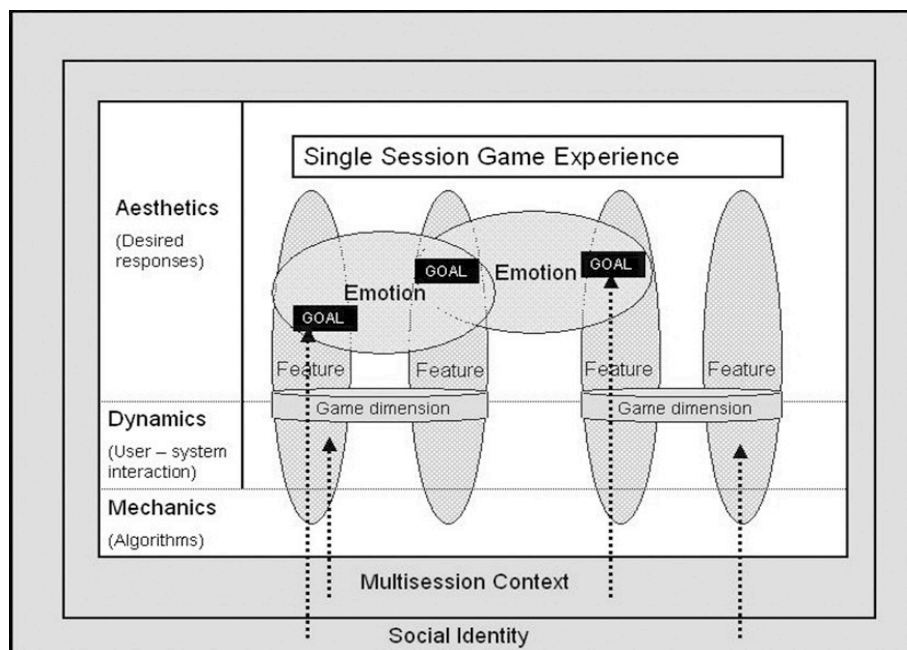
Figure 18. Overview of framework for describing game experience Tan and Jansz, 2008, p. 535)

Gee (2003, 2013) argued that video games could be either good or bad. Games should not be too difficult nor too easy, boring or else undesirable. Moreover, Mäyrä (2008, p. 52) added that it is important to know the interactivity in playing games. "What games are and what they do, is at the very core of gameplay". So, Gee (2013) summarized that good games give players the chance to customize their playing experience by changing the level of difficulty and challenging them. Furthermore, games connect the language that they use to a specific meaning such as images or action. However according to Gee (2003, 2013), great consideration should be given to the way that games teach players to play, to understand the games and to stimulate students' motivation and interest to play. Good video games teach something rather than just playing the game itself.

The definition that Juul (2011, pp. 36-43) created, showed six features of video games:

A game is a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, and the player exerts effort in order to influence the outcome. The player feels emotionally attached to the outcome, and the consequences of the activity are optional and negotiable.

Chik (2012) identified three aspects of video games related activities in foreign language learning. First, the consumption of in-game texts, such as a game character's dialogue. Second, the interaction with other players' in-game provides reasons and opportunities for authentic English language use. Third, the most important aspect of learning through video games is participating in game-related discussions, as well as reading game-related online materials. Chik (2012) also identified online gaming communities as a way for language learning and use.

2.2.4. Multimedia and online computer games and learning vocabulary

One of the online computer games' characteristics that makes them very useful in learning is multimedia (Cornillie, Jacques, De Wannemacker, Paulussen, and Desmet, 2011). This means that online computer games could show new vocabulary verbally, aurally and visually as they use words, sounds, pictures, music and oral communication. Gee (2012, in Reinders, p. xiv) said that:

Games associate words with images, actions, goals and dialogue, not just with definitions or other words. Learners come to see how words attach to the world's contexts or situations that they are about and help to create or manipulate. If learners can only 'cash out' words for words, they have a purely verbal understanding of talk and texts. This may be good for test passing but it is not good for deep understanding. If they can 'cash out' words for images, experiences, actions, goals and dialogue – for a virtual theatre of motivated action in their minds – then they have deep understanding and real learning.
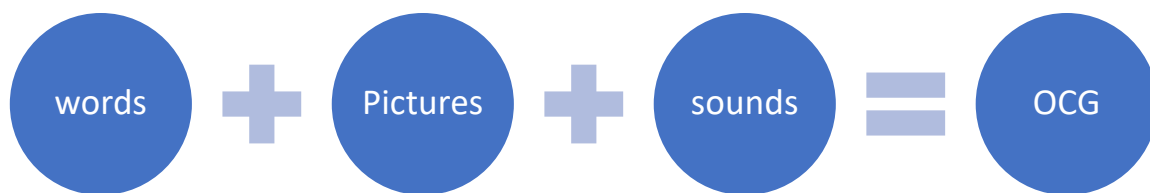
Figure 19. Multimedia in online games

This is considered to be a very important tool in learning languages because of three reasons: first of all, students have different learning styles, so they need different ways to acquire knowledge and this is something games can provide. Secondly, it is said that multimedia helps students to connect the visual and verbal mental representation systems (Mayer, & Sims, 1994). Finally, it is stated that multimedia is attractive. It was argued that the structure of the game that contains pictures, sounds and emotion is what makes a good game as stated by Becta (2001, p. 1) "what is captivating for players about games tends to be their structure rather than their content. Structure involves dynamic visuals, interaction, and the presence of a goal and rules that govern play".

According to Fatt (2000, p. 34), "People use their five senses to gather information and then channel it through three separate routes, called representational systems, to make sense of it". Some students are visual, auditory, kinesthetic or multi. They are either social or individual learners.

Fatt (2000, p. 35) stated that people with a visual learning preference "see the world by constructing or remembering mental images". Those learners like to read, observe, and display data and visual aids. Besides, learning better by watching movies, film strips, pictures, and graphs helps integrate the subject. On the contrary, auditory learners like to learn with sound. Moreover, they prefer everything related to learning by listening like lectures, seminars, discussions, and tapes. The third type is Kinesthetic, and learners of this type prefer to learn by doing and moving. Besides, they like creating and developing things they have learned (Fatt, 2000).

When teachers are aware of different learning styles, they will provide students with the appropriate environment which helps them to learn better and minimize learning problems (Fatt, 2000). According to Manochehri and Young (2006, p. 314), "Researchers believe that learning style is a good predictor of an individual's preferred learning behavior". Above all, the corporation between learning and teaching styles increase achievement since learners enjoy what they learn (Naimie, Siraj, Abuzaid, & Shagoholi, 2010).

So, it is important to use strategies in teaching vocabulary that suit students learning styles: texts, pictures, audios or a combination of them therefore multimedia contents may be appropriate for different learner styles (Birch, & Sankey, 2008).

Fleming and Mills (1992) modified the learning styles from VAK (visual, auditor and kinaesthetic) to VARK (visual, auditory, kinaesthetic and read/write learning style which is related to text that learners can see, write or read (see figure 20).
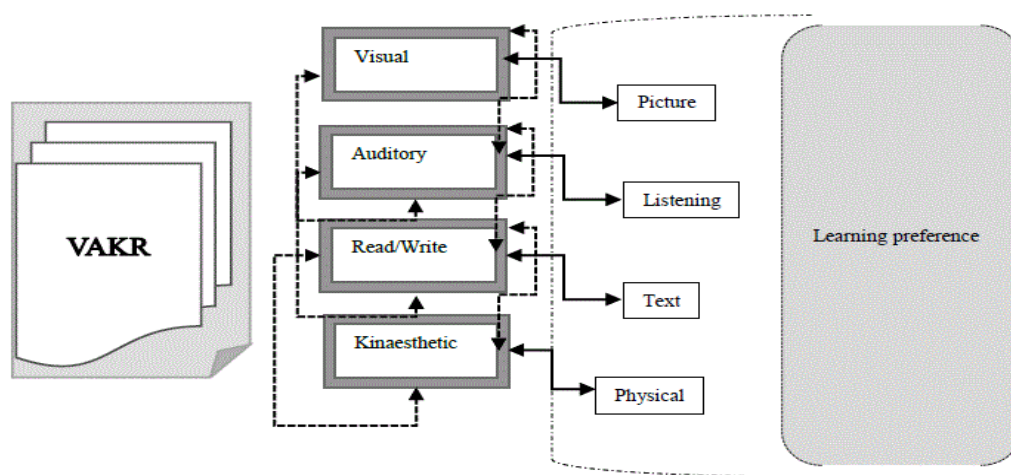
Figure 20. VARK learning style proposed model (adapted from Alduais AMS, 2018, p. 2)

Many studies investigated using different tasks for "different learning styles" in learning vocabulary. Learners who learn vocabulary by reading and listening in context acquire vocabulary better than others (Brown, Waring, & Donkaewbua, 2008). Moreover, Webb, Newton, & Chang, (2013) had mostly the same result and it indicated that using reading and listening techniques are very beneficial since reading text only makes students focus on difficult words while listening makes them connect the text with the meaning which helps students to understand the unknown words (Brown et al., 2008; Webb et al., 2013).

According to Aloraini (2005), multimedia can be one of the best educational techniques as it depends on using various senses simultaneously. This includes texts, spoken words, sound & music, graphics, animations and still pictures.

In addition, "significant increases in learning can be accomplished through the informed use of visual and verbal multimodal learning" (Fadel, & Lemke, 2008, p. 12).

Further conclusion by Askildson (2001) showed that text and pictures help students to learn language better than using text alone. Vocabulary in a foreign language can be learned easily if words are integrated with images and aural or written translations than learning them only with text or pictures (Oxford, & Crookall, 1990). When pictures and texts are associated with each other, the learning process accesses different parts of the brain to create deep learning (Mayer, 2001). Similarly, it was claimed that according to the generative theory by Mayer (1997), in learning vocabulary as a second or foreign language, students have two verbal systems for the first and second languages and pictorial system. So, to learn a new word, the verbal and pictorial systems should work together.

Mayer (2009) argued that it is more beneficial to use a combination of pictures and words rather than using pictures or words alone to teach vocabulary. "Word" may refer to a spoken or written word, and picture can be photos, videos, illustration, drawing or animation. Moreover, multimedia helps students to transfer and remember their knowledge (Alfar, 2009, p. 123).
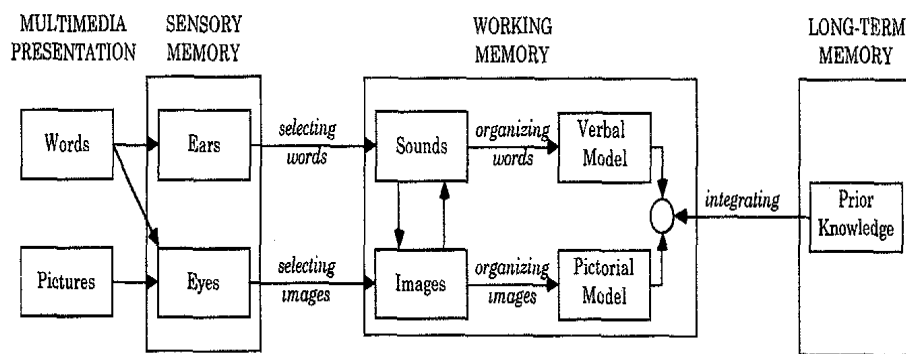
Figure 21. Multimedia in the learning of vocabulary (Adapted from Mayer, 2001, p. 54)

The above figure shows that when using multimedia in learning vocabulary, new words can be shown by images or by letters. For example, in teaching fruits, a picture for "apple" or the word "apple" can be written in letters. When words are shown in letters, learners can hear or see it. Moreover, when this word is displayed with a picture, students see it. So, ears and eyes are used to learn, and this causes an integration between the verbal and pictorial representations. Which leads to learning vocabulary and this knowledge stays in the

long-term memory (Ebrahimzadeh, & Alavi, 2017) as indicated in figure 21. However, with online computer games not only can the words be heard and seen but so can the picture. Since pictures refer to specific words, the players can also hear them.

According to Kent (2004), with multimedia and computers, students will move from being dependent and passive learners to independent and self-regulated learners where they are responsible for their learning. Moreover, this fosters autonomous learners in learning vocabulary (Kent, 2004, p. 72).

While playing video games, players acquire vocabulary unconsciously (Huang, & Yang, 2012). The unintentional learning is explained in cognitive psychology as incidental learning that happens while reading, listening or doing something else (Huang, & Yang, 2012). Massive multiplayer online role-playing games provide a rich and authentic meaningful environment that focuses on spoken and written vocabulary (Ghanbaran, & Ketabi, 2014; Young, & Wang, 2014).

Multimedia games motivate learners and encourage their vocabulary, and this causes active participation which reinforces learning (Baltra, 1990; Bell, 2005; Carrier, 1991; deHaan, 2005; Hubbard, 1991; Li, & Topolewski, 2002). Underwood (1989, p. 19) said that "we remember images better than words; hence we remember words better if they are strongly associated with images". A study by Yip and Kwan (2006) concluded that students' attitudes toward learning vocabulary had changed with the introduction of multimedia games. In addition, multimedia games reduce the workloads in cognitive learning during the acquisition of information (Mayer, 2005).

However, Singh (2003) indicated that multimedia should be designed effectively since students have low knowledge and low motivation toward learning, but with a focus on the visual objects which help students to learn new words (Cornillie, Jacques, De Wannemacker, Paulussen, and Desmet, 2011).

2.2.5. Theories related to online games

In order to discuss how students acquire the L2 or FL, many learning theories have been discussed. According to Siang and Rao (2003), it is very important to study computer

games and the theories of learning like behavioral learning theory, cognitive learning theory and motivation theory. First of all, behavioral learning theory clarifies that "Learning is frequently defined as a change in behavior due to experience. It is a function of building associations between the occasion upon which the behavior occurs (stimulus events), the behavior itself (response to events) and the result (consequences)" (Burton, Moore, & Magliaro, 1996, p. 9).

This theory shows how practice and exercises with games motivate players to learn in real-life (Bogost, 2007) This takes place in three steps which can be easily controlled such as contiguity, repetition, and reinforcement. In the first step there should be direct stimulation for students' response. Repetition means that learning can occur if the situation and response is repeated or experienced. Lastly, learning can only be innervated if it is followed by reward (Gleitman, 1995; Saettler, 1968). However, students should be subjected to stimuli, and after some time they begin to understand and respond to this stimulus (Case, 1996; Ertmer, & Newby, 2013). This means that teachers ought to introduce the information to students first and give them opportunity to practice it. This is followed by feedback to consolidate what they have learned.

Behavioral learning is promoted when computer games focus on the combination between eyes and hands like fighting and sports games. Behaviorists believe that learners (metaphorically) can learn by stimulations. Those learners can be studied by observing their response to stimulus. There are two types of conditioning related to behavioral learning: classical conditioning and operant conditioning. In classical conditioning, an unconditioned stimulus with previous neutral stimulus promotes a conditioned response and this is clear when player plays games (e.g. when they see a particular object, they know that they are about to be attacked) Players have the same conditioned response to different stimulus. Whereas, in operant conditioning players need to learn about the unconditioned responses before playing. In this kind, punishment and reinforcement are very important to motivate students to play and achieve the game's goals. Besides, feedback should be given immediately (Siang, & Rao, 2003).

However, Mayer (2014) used the reinforcement theory which is related to behavioral theory. He indicated that:

> Behaviors that are followed by satisfaction to the learner are more likely to be repeated in the future under the same circumstances, and behaviors that are followed by dissatisfaction to the learner are less likely to be repeated in the future under the same circumstances. (p. 64).

However, the reinforcement theory was developed by Thorndike. This way was used in digital games not only games for learning but also vernacular games that apply the kind of reinforcing feedback that has lots of advantages in learning. For example, players were given a question or a problem to find solution for. If gamers answer it correctly, they will be encouraged with positive feedback. On the other hand, other hints will be given for players if they give a wrong solution or answer (Mayer, 2014).

On the contrary, the cognitive learning theory focuses on mental processes to promote cognitive learning. The most significant computer games in this field are adventure games, strategy games and puzzle games. In this theory the most important thing is memory. In behavioral theory learners (players) learn by experiences and mistakes; whereas, in cognitive theory players learn when they understand the rules and think cognitively. However, human thinking and problem-solving processes are similar to computer processes since these consist of symbol manipulation and transformation (Newell & Simon, 1972). Direct instruction and practice are the main strategies in cognitivism (Case, 1996).

With regards to cognitive theory, games have many advantages which make them important in education. Firstly, games help learners to learn and practice their knowledge at the same time e.g. players have a problem and they should look for a solution which makes learning occur through experience and is therefore fixed in the long memory (Gentile & Gentile, 2005). Secondly, players are also decision-makers which gives them the chance to compete the challenge or the mission by going through trial and error (Sheese, & Graziano, 2005). Players discover their mistakes and take some hints from the immediate feedback that games provide (Kirriemuir, 2003). The most significant thing about games is that they change the difficulty and complexity of the game when players complete a level in which gamers develop their skills and knowledge (Gentile, & Gentile, 2005). Also, games create a suitable environment for different players' levels, whether they are slow or fast and new or

experienced. This is what the school curriculums are trying to achieve (Bruner, 1960). Mitchell and Savill-Smith (2004) claimed that when games become more difficult, this supports the cognitive process and improves strategic skills. Natale (2002) added that difficult games make the brain more active, lead to better learning and motivate different social, academic and computer skills.

The third type of theory is constructivism. Woolfolk (1993, p. 485) explained the learning process from the constructivism point of view as:

> The key idea is that students actively construct their own knowledge: the mind of the student mediates input from the outside world to determine what the student will learn. Learning is active mental work, not passive reception of teaching.

They believe that knowledge is constantly being constructed, is not something founded (Rorty, 1991). Which means that teachers cannot teach students, but they can help them in finding things. Moreover, learners acquire different knowledge based on their different experiences and beliefs (Jonassen, 1991), and they discuss this with others which improves their understanding. However, different learners mean different understanding depending on their personal experiences. It is more important for learners to have the ability to defend their perspectives to show "viability" (Cognition and Technology Group, 1991). According to Savary and Duffy (1996, pp. 2–3) constructivism has three main points: understanding occurs in the interaction with the environment; puzzlement is the stimulus for learning, determining the nature of what is learned; and knowledge advances through social negotiation and evaluation of individual understanding (i.e., its 'viability'). This clarifies that this theory stands on discovering things as most of the computer games like adventure games give players visual or verbal instructions which are considered basic rules that help players to complete their mission (Siang, & Rao, 2003). So, video games support constructivism as students learn from their experience in playing games (Cohen, 2011; Prensky, 2006).

Mayer (2014) used what is called schema theory formed by Jean Piaget in 1926. This claimed that learners need to build their mental mode of the issue to learn it. It is very important to learn categories and concepts related to the field of study to be an expert on it. So, this theory is crucial as a framework for educational games. To interact with the simulation without guidance is inefficient. It is not the best approach to study informal

learning through games although it is important in understanding the relationship between concepts in many theoretical subjects such as English grammar.

According to Whitten (2012), games which are used in education are connected with different approaches: constructivism, experimental and collaborative approaches to learning. This author added that games created a meaningful environment for playing, and this needs to enable social negotiation and problem-solving skills which are considered important principles for constructivism. Video games support the constructivist concept of learning, which asserts that learners construct their knowledge based on their experiences (Cohen, 2011). Because of the difficult task educators face providing meaningful instruction to all learners, issues of whether video games promote student learning should be considered during teacher preparation (Panoutsopoulos, & Sampson, 2012). However, Whitten (2012), identified three aspects that education games construct. Firstly, educational games based on constructivist theories depend on activities and players involvement and interaction with the games to shape their own knowledge about the subject that they have studied as stated by Egenfeldt-Nielsen (2006, p. 198):

> In a constructionist perspective… the challenge is not to design an educational video game with relevant content. Rather, the hard challenge is to facilitate playing that makes the player engage with the material, discuss it, reflect on it, and use the video game as a means for constructing knowledge.

The second aspect is that games are beneficial for experimental learning since they give players the ability to test their hypotheses, see their effects and react to the outcome. The third is the collaboration aspect which shows that players can contribute to the game. Thousands of players in massive multiplayer online games (MMORPGs) play at the same time or one at a time on the same device. In these games, players can be connected, which means that constructivism takes into account the social aspect and it is believed that the social and intellectual learning environment is one (Vyogotsky, 1986).

The last theory that Siang and Rao (2003) discussed is motivation theory. It is very important to explain motivation and learning since learners who are motivated learn better. Additionally, motivation is crucial as it internally activates and guide learners' behavior (Prensky, 2001). Computer games create intrinsic motivation toward learning and to motivate players, designers should know learners' needs and these can be identified by studying

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Maslow's hierarchy. In addition, to benefit from this hierarchy, designers should fulfill students' needs from the lowest level to the highest level of the pyramid (Siang, & Rao, 2003).
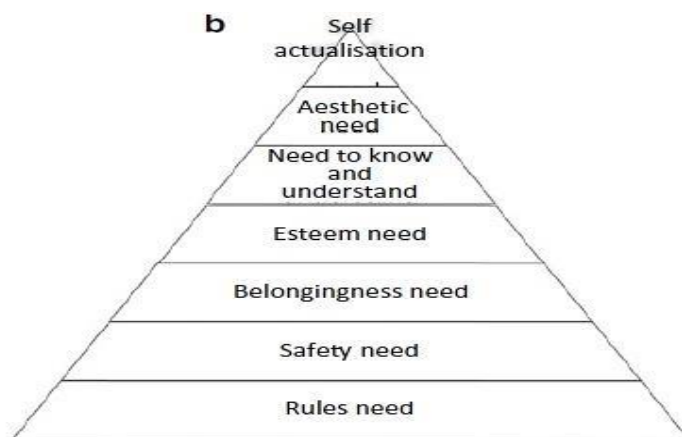
Figure 22. Hierarchy of the players' needs (Siang, & Rao, 2003, p.6)

The most important thing for players is to have the game rules and to understand and to follow them since without them players would not be encouraged to play. Then players move to the safety need as they receive information about the games, they can play a game for a long time to win. After they feel safe, players need to have the feeling of belonging which comes as a result of feeling comfortable and accomplishing the goal of the game. It is important for them to know that they can win. In addition, this feeling is related to esteem need which means that students will be able to gather information about how to develop their ego. Next, games should be under the player's control which helps them to understand the game's strategies and hidden items. After this, they wait for more challenges. When taking about aesthetic need, this means that players at this stage start asking for sound effects, music and pictures. Then at the last level, gamers will have the ability to do everything the game asks of them since they have got to know the rules and the challenges (Siang, & Rao, 2003).

Mayer (2014) added the social learning theory as very important point related to digital games. This theory was developed by Albert Bandura 1970s but has become better-known since 1980s and confirms the concept of strategic knowledge. In addition, this strategy claims that people learn what to do when they watch other people who already have the knowledge.

deHaan, Reed, and Kuwada (2010) found that students who watch gamers play, learn better. In addition, students may learn from the game itself as many of them provide players with agent on screen or co-operating computer characters to give examples or hints for gamers to complete their tasks. Many multiplayer games motivate social and collaborative learning. Students may co-operate online with others or with gamers who play on the same screen in the same physical environment. However, the students do acquire new skills from the game. The social theory is important when studying how teenagers learn English when they play online games with others. Salen, Torres, Wolozin, Rufo-Tepper, and Shapiro (2011) focused on the idea that using games in education confirms that learning is a social event and it is in the center of practices and context and this way is not limited to a specific time or location.

Similarly, Gee (2003) commented on the "zone of proximal development" (ZPD) idea, which is part of social constructivism. It refers to the tasks in which learners need help and assistance from other learners at more advanced level because social interaction develops and helps students to learn. Similarly, in games, players need other gamers at the advanced level to help them in order to complete their task. This term was developed by Vygotsky who stated that testing and educating students should not only focus on the students' current levels but also on their potential development. According to Cole and Cole (2001), ZPD supports students' abilities and develops them. This agreed with one of Gee's (2003) principles the "regime of competence" which claimed that games challenge players to do difficult tasks that encourage them to improve their skills.

In recent decades, Activity Theory (AT) has been widely used in the field of human-computer interaction (Engestrom, 1996; Nardi, 1996). This theory was developed for the first time by the theorist Vygotsky (1920s, 1930s), and It was said that activities are part of the socio-cultural context and learners' behavior. However, by being involved in activities students not only interact in the setting of learning but they also change it. Leont'ev (1978) added that AT is not only a reaction to activity, but also a system that has its own rules. One of Vygotsky's ideas was adopted as a very important part of the theory, which is the tool. Tools are the social objects which are used in a cultural environment. It could be external (physical and technical) like a computer, or internal (psychological) like rules, procedures

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and methods. However, Squire (2001) argued that it is the appropriate theory for describing the interaction in playing games, players goals and the intentions during the social-cultural context. So lately, the activity theory has been used related to games to discover the extent of their impact on players. Leontiev (1978) stated that learners have specific goals (idea or case) so they work on a subject (individually or in groups), to achieve their goal by utilizing tools from their culture. Games are created using this theory in order to create an environment in which students can be connected and interact with objects, other subjects and tools, and this interaction leads to outcome shown in figure 23. Moreover, it seems that this theory helps in developing or choosing educational games to use in education. The activity theory "…affords a holistic description of an activity system in terms of its basic components and interrelations" (Karasavvidis, 2009, p. 438).

However, Paraskeva, Mysirlaki, & Papagianni (2010) added that there are six factors related to game (subject, object, tools, the rules, community and the division of labor) as shown in the figure 23. And in each factor, there are several components. What is more important is the relation and interaction among the factors and the components as explained in figure 24.
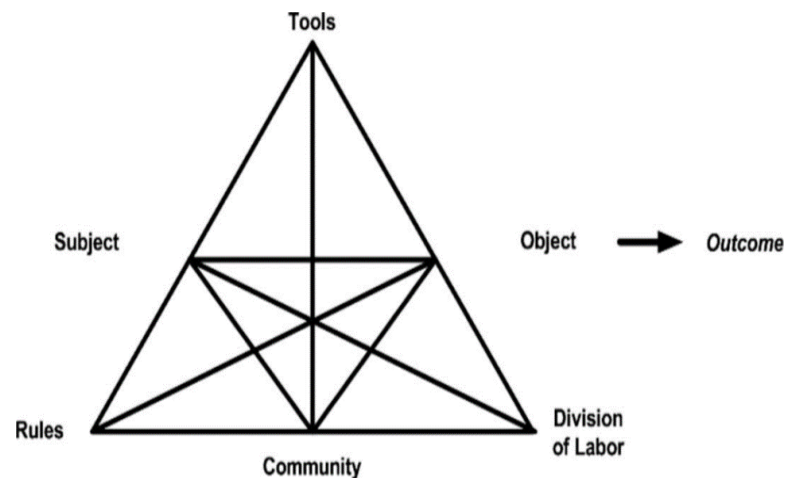
Figure 23. The activity system (adapted from Paraskeva et al., 2010, p. 502)

Engestrom (2001) developed the AT model as indicated in figure 24. The model showed that activity has different elements which make it active and effective. The subject can be the teacher or a student, depending on the aims of the study. The object of the activity

is to foster teaching, utilizing digital technology as a part of a pedagogical tool. Teachers here are part of the community which includes the other school's members and the students in the classroom.
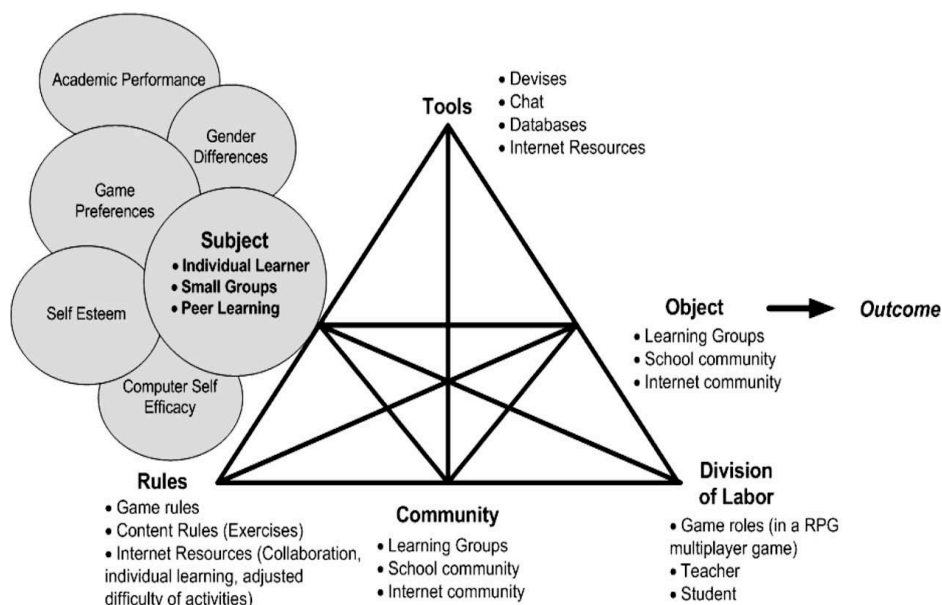
Figure 24. Activity system in online computer games with subject factors adapted from (Paraskeva et al., 2010, p. 503)

Teachers use different tools to support the objective of the activity such as material, evaluation and teaching tasks as well as technology. This also includes specific rules that teachers apply in the classroom. The division of labor means that the power in using technology is shared between teachers (the subject) and students (the community) and it combines the objectives of using this technology and how it affects the learning experience. Also, objectives include teachers and students' opinions toward using technology. Finally, the outcome of the activity system appears to show whether technology does or does not promote learning and teaching in the classrooms.

The subject factor is the most important, since it is influenced by different important aspects such as gender differences and preferences, with a view to developing computer self-efficacy and enhancing academic performance and self-esteem as clarified in Figure 24. It is said that the activity theory system is very complex as it connects the subject aspects to drive

the learning outcome. Those aspects should be taken into consideration to make encouraging games. In games like MMORPGs players find and shape their own communities which help students to learn with social activities, but this could not happen without taking the previous factors in consideration (Paraskeva et al., 2010). However, Prensky (2001b) explained that the interaction factor is very important in video games especially in multiplayer games since players need to play with other players without a fixed place or time.

Video games could be considered cognitive, constructivist and behavioral in nature. Cognitive theory is used to create video games which lead to positive behavioral outcomes (Bandura, 2006). In addition, games use repetition "behaviorism" and then the organization of thought and adaptation are considered as "constructivism" (Ang, & Zaphiris, 2006). According to Prensky (2001b), learners learn better when they experience and do something rather than when being told about it since this constructs the information in their minds. Moreover, it is mentioned that engaging in the construction of physical tools leads to effective learning. It was indicated that recently, Activity Theory is more popular among educators and researchers (e.g. Lim, & Hang, 2003; Karasavvidis, 2009) in the technology and education field (Verenikina, 2010).

2.2.6. Digital games in education

In this section, digital games related to education in general and vocabulary in particular will be discussed. Learning vocabulary while playing online computer games and massive multiplayer games will be the main focus.

There are many advantages of using digital games in education in general as games can benefit the learning process: they facilitate the learning experience (Barab, Gresalif, & Arici, 2009). Also, educators think that using games for learning will turn difficult subjects into easier and more fun subjects (Papert, 1993). In addition, video games create an environment where learners can discuss outcomes in order to understand other concepts well. Also, Schlimme (2002) claimed that digital games play a very important role in improving learners' spelling and reading. Furthermore, students with low confidence will be able to gain communicative skills in any difficult language (e.g. Arabic).

Psychologists have shown that video games are a very important tool in learning because their virtual worlds help students acquire information easily since they give them the chance to connect game knowledge with real-world practices (Shaffer, Squire, Halverson, & Gee, 2005). Similarly, Siang and Rao (2003) added that psychologists have found that learning can happen naturally by using games as players have the motivation to play. Moreover, games create an appropriate environment for leaning, in which learners do not get the information from their teachers but acquire their own knowledge from their interaction with the environment around them. This was also proved by Prensky (2001b) who mentioned that digital games make learning interesting and students can play things as if they were real in a virtual world like flying a plane. They have many graphics and they can play them on the computer, by themselves or with others. This means that in multiplayer games, anyone anywhere in this world can play if they are online. Digital games provide many options and scenarios and they have an infinite amount of content. Different levels of challenge can be provided by these games and they allow players to be involved. In addition, these games can be modified, updated and customized by each player's needs and desires.

Gee (2003) counted 36 learning principles that games encouraged and many of these are connected to language acquisition. The first is "Active, Critical Learning Principle" (p. 207) means that games make students active rather than simply being listeners. The second is, "Design Principle" which it is the main principle that leads to learning experiences. The third is, "Semiotic Principle" which means learning that happens through multiple sign systems (images, words, actions, symbols, artifacts. Moreover, "Semiotic Domains Principle" refers to mastering which comes through participation with groups. Also, there is the "Achievement Principle" which shows that gamers have intrinsic motivation appropriate for players levels and efforts and the players achievement increases from one level to another. However, good games motivate players to complete their tasks. Besides these there is the "Practice Principle" which shows that players can practice the language in real situations in which is interesting and fun and players spend a great deal of time practicing them. This shows the importance of task-based learning and practicing what students learn (Ellis, 2003; Reinders, 2006), and input and output in the target language which makes learning easier

(Swain, 2000). Another principle is the "Regime of Competence" Principle', when players are involved in the game and they need to achieve the game's goals. They face different challenges, but this does not mean that tasks are impossible. Easy tasks mean routine and may lead to boredom and this does not help improve skills. The learners' competence is to concentrate on the meaning more than the tool. the most significant principles are the "Transfer Principle'" and "Intuitive Knowledge Principle", in which players repeat tasks and experiences which help students to learn.

The previous study by Brian Sutton-Smith (1986) claimed that video games help students to gain five experiences: Visual, Auditory, concentration, the perceptual pattern of learning and physical. These can be gained by going through the processes of language input and output (Peterson, 2013). It must be noted here that games should meet learners' intellectual needs (cognitive, emotional, social and namely needs), and this can occur during play as problem solving skills are part of cognitive need. Besides, players must finish one level to move on to other and the reward that the game gives in each level motivates players to learn and to develop their skills. Emotional need is one of the most sensitive aspects of learning languages. Players face failures before winning but this feeling disappears when they achieve success. In addition, immediate feedback motivates and encourages players as they give them the chance to improve. The most important thing in playing games is that making mistakes is necessary to succeed which means that gamification is making a positive experience from negative feelings (Lee & Harmer, 2011).

Learners give up when they fail in the classroom, but their reaction is different when they are using games as they play again without giving up. Video games encourage sedulity, practice and learning until players complete their mission and succeed (Gray, 2012). Krashen (1982) pointed out that it does not matter which level students start with because after finishing, they will move on to the next which means more challenge and more learning. Moreover, players spend many hours not only reading but also writing during play (González, & Izquierdo, 2012).

Also, González and Izquierdo (2012) stated that learning with video develops students' skills like: cognitive skills, methodological skills, technical and language skills and

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teamwork skills. Moreover, the capacity for self-criticism increases because games involve students in practicing the language. Similarly, Gee (2005) pointed out that video games stimulate different mental skills like critical thinking, reasoning, and problem-solving, as well as decision making and strategizing skills. In addition, Shahrori and Rimawi (2011) agreed that digital games affect problem solving skills, memorization and taking decisions positively. Ahmad and Jaafar (2011) stated that games are not only for fun, but they also make students able to gain cognitive and effective elements. Learners do not only learn about the subject, but they also build their own personality. In addition, learners learn how to solve a problem, make decisions and conclusions and work collaboratively with their friends. This can only happen if those games are used in the appropriate way as Griffiths (2002) mentioned: "Videogames have great positive potential in addition to their entertainment value and there has been considerable success when games are designed to address a specific problem or to teach a certain skill" (p.47).

According to Chuang and Chen (2007), many teachers use digital games in teaching different subjects like English, science, mathematics and literacy and they noticed that this tool improves students' performance in those subjects. Additionally, computer games are a new trend not only for the younger generation because both children and adults play them as they are fun and make learning more enjoyable (Ahmad, & Jaafar, 2011)They also foster problem-solving skills; develop participants' fact/recall processes (Chuang, & Chen, 2007); make students learn better; and language learning becomes entertaining and easier so teachers should use them (Donmus, 2010).

A study of a group of Iranian children showed that digital games motivate students to learn and increase their cognitive achievement. Besides that, they create an enjoyable classroom atmosphere and reduce the stress that students face when learning vocabulary (Aghlara, & Tamjid, 2011). A previous study with Palestinian students on using educational computer games in learning English showed that they have many advantages. They provide students with a better learning environment which increases their achievement and students are motivated to participate (Qteefan, 2012). Using games in teaching has a positive impact on students' achievement and attitude toward their lessons; whereas, using games did not

affect students' cognitive skills (Yildirim, 2017). similarly, according to Margoudi and Smyrnaiou (2015), online games are a very significant way for teaching children with ADHD (Attention Deficit Hyperactivity Disorder) as they positively affect students' attention and impulsivity but show no changes in cognitive ability. Also, deHaan (2005) added that this way improves learners' ability in listening and reading comprehension.

As well as researchers, teachers also agreed that digital games have a positive influence on students' learning. Alabbasi (2018) found that after investigating 47 in-service and pre-service teachers, despite of some teachers' beliefs that games affect students negatively, most teachers believe they have a positive role in classroom. Similar results were found by Sandford, Ulicsak, Facer, and Rudd (2006) who investigated the impact of games on teachers and students. Those teachers claimed that games engage students to learn and they use them to raise students' participation, interaction, involvement and motivation.

2.2.7. Learning English Vocabulary with digital games

Computer games have become very popular in teaching vocabulary and they have many pedagogical benefits as they help students to retain and learn words effectively and in the long-term memory (Yılmaz, 2015). Moreover, students' vocabulary can be improved easily with activities outside the classroom like playing computer games (Sylvén, 2004). In addition, it is very noticeable that the performance of students who learn with video games is higher than students who do not (Mayer, 2014). Also, there is a relationship between playing digital games and students' motivation to learn English. Digital games involve students in a language activity especially male students and students' motivation is enhanced (Sundqvist, & Sylvèn, 2014). Additionally, video games help students to communicate orally and to acquire new vocabulary (Väisänen, 2018). Schwienhorst (2002, p. 206) stated that video games "can bring a language learner closer to the target language community and its speakers while also providing an array of tools for awareness raising activities and critical reflection".

Playing video games provides students with good vocabulary and oral skills. Also, this way reduces anxiety and makes learners practice the language (Sundqvist, 2009). Uuskoski

(2011) had a similar point of view, he also found that video games affect students' learning of English positively. Students who play more video games got higher marks than their classmates who play less. In addition, video games repeat words in written and oral ways which help learners to learn vocabulary and they develop interaction skills since players are in contact with each other while playing games (Piirainen-Marsh, & Tainio, 2009). A study by Erkkilä (2017) viewed that playing digital games helps students to practice the language. The results showed that 90.6% of students agreed that games help them to improve their vocabulary and 53% of students claimed that video games helped them to acquire language. As a result, Thomas (2012) clarified that games become pervasive, beneficial tools for learning in the classroom and are not merely ice breakers, so they deserve to be studied as they open a new way of teaching. This point was used by Ang and Zaphiris (2008) who focused on the computer as a virtual environment and computer games as a tool that facilitate learning when studying digital computer games.

It was argued by Gee (in Reinders, 2012) that video games are a good way to see learning in and out schools. In addition, Gachkova and Somova (2016) clarified that learning with games allows learners to learn with fun, motivates them to learn, lets them practice in an environment that stimulates real life experience, learn better and it makes the learning process much easier.

Vahdat and Behbahani (2013) explained that using video games in learning vocabulary is more beneficial than the traditional way since this creates a virtual environment which is considered to be the strongest tool in teaching languages because it uses pictures, graphics, and creates authentic situations which help players to learn (Shaffer, Squire, Halverson, & Gee, 2005). Video games teach with audio and video techniques, so they motivate students to learn and encourage them to guess the new words' meaning without fear or feeling anxious about giving a wrong answer (Spingytė, & Jasnauskaitė, 2016). By playing computer games, students speak English in context which improves their vocabulary skills (Zengin, & Yetkin Aker, 2016). Besides, learning by doing and watching as we do in computer games, help students to retain their new vocabulary in the long-term memory (Franciosi, 2017).

Moreover, games introduce unfamiliar words that students need to learn to succeed in the various levels, and this also motivates them to learn new vocabulary (Schlimme, 2002).

According to Gee (2003), computer games provide students with the comprehensible input that they need. This tool gives students different levels of difficulty in which players have the choice and some have various levels of difficulty which players should move through. This affect students' vocabulary as transferring from one level to another means acquiring more vocabulary. In addition, computer games provide different game levels for low and high achievers which challenges all students, motivating them to learn and practice the language (Hirumi, & Stapleton, 2008). Kahraman and Zengin (2014) added that students work with mnemonic strategies in order to make a connection between the target vocabulary and words from the native language at phonological and semantic levels. Students want to remember the new vocabulary to win the game. Piirainen-Marsh and Tainio (2009) showed that video games help students to repeat language "On the whole, repetition offers a flexible resource through which the participants display continued attention to relevant features of the game and co-construct the collaborative play activity" (p. 166). This study however, did not show how repetition affects acquisition of the language.

In addition, Saffarian and Gorjian (2012) pointed out that computer games influence students' performance positively, they stimulate problem solving skills, and help students in recalling (Chuang, & Chen, 2007). Computer games and motivation are connected as students enjoy learning with computer games which motivates them to learn. Also, computer games are a key factor in motivating weak students to participate and learn (Wu, Lee, Chang, & Liang, 2013). According to Letchumanan and Bee Hoon (2012), 90% of students agreed that computer games are the most preferable way to learn vocabulary and students enjoy learning in this way. Computer games help students to remember words and recall them and low achievers and timid students performed better after using them (Johnson, Marsella, Mote, Viljhalmsson, Narayanan, & Choi, 2004).

A previous study by Aghlara and Tamjid (2011) showed that using computer games with students six and seven-year-old who had no previous knowledge of English resulted in them learning English vocabulary better than their counterparts who learnt using traditional

activities. Yudintseva (2015) and deHaan (2011) claimed that applying computer games not only provides students with vocabulary strategies but also with authentic contexts that help them practice the language and technological skills. Moreover, computer games develop learners writing and speaking skills (deHaan, 2011), improve students' spelling (Shokri & Abdolmanafi-Rokni, 2014); as they give students the opportunity to learn the new words, their correct pronunciation and how to spell them (Uzun, 2009). They also cause learners to learn vocabulary effectively when they are engaged in playing (Yudintseva, 2015). However, a study using Japanese undergraduate University students about learning vocabulary with a music video game, concluded that players themselves did not recall as much vocabulary as the students who only observed them playing (deHaan, Reed, & Kuwada, 2010).

Hitosugi, Schmidt, and Hayashi (2014) used mixed-methods to study the effects of *Food Force (FF)*, a UN-sponsored off-the-shelf videogame, on learners and learning Japanese as a second/foreign language. Two studies were used. In the first study task worksheets were used to teach vocabulary, whereas in the second study, students learned FF vocabulary explicitly with video games. Both groups took pre- post, and delayed tests as well as an end-of-unit affect survey. Also, textbook vocabulary tests and interviews were used in the second study. This research proved that games affect students learning positively and is proof that digital game-based learning helps students to learn deeply. Five weeks after the experiment, students could remember the words they learnt from FF but not from the textbook. Therefore, students in the second group learnt vocabulary better than those in the first one.

Also, Nation (2001) explained that acquiring vocabulary happens through three processes: noticing, retrieval and creative or generative use. Noticing is turning input into intake. When learners focus on the words, they can recall them from their memory. After this, learners will be able to use these words in a real context which means creativity. Hence, the appropriate way to engage them could be by using games since they prefer an inter active learning environment, and games provide students with motivation, enjoyment, pleasure, and creativity in learning (Sharp, 2012). Also, teaching students with computer games gives them

the chance to acquire language and use it authentically, and they have features that encourage noticing which leads to effective learning (Squire, 2006).

Jackson, Witt, Games, Fitzgerald, Von Eye, & Zhao (2012) argued that serious games are very useful in education as they give gamers the chance to interact, adapt and individualize. This way helps students to practice what they learn. Also, instructors and teachers will be able to observe students' scores which show them their students' work and improvement. Shank and Neaman (2001) added that with these, students can be assessed easily. Games give different types of feedback which help players to achieve their activities such as: points for correct answers or a reaction from other characters in the game. Besides, this tool engages students in practicing knowledge and skills within the game (Jackson et al., 2012). Marton (2006, p. 528) stated that "what the learner learns in some situations might enable her to do something different in other situations thanks to perceived differences (and similarities) between situations".

According to Gee (2007, pp. 143–144), games and language acquisition are connected. Words can be verbal or situated understanding. Verbal understanding means that words are studied in terms, but this does not mean that the person can use them in a real situation. While situated understanding is the opposite as the person can indeed use the words in real situation. Also, they may be connected with pictures, actions and different activities to achieve some goals and solve problems. However, different studies showed that computer games work on learning the words in the second way which is the "situated learning" and this helps in improving vocabulary. This was proved by Rankin et al. (2006) who found that learners' vocabulary increased by 40% as a result of playing the MMORPG *"EverQuest 2"*.

Sundqvist and Sylvén (2012) used three empirical studies in the article and these were conducted with Swedish learners. The researchers focused on extramural English activities and the relationship between using computer games and vocabulary acquisition. The first study took two years in which students who were in 10th grade were tested 3 times. The results showed that students who learned with CLIL acquired a larger amount of vocabulary than the students who learnt without CLIL. The second study concentrated on extramural English and how this affects vocabulary and oral skills. This study lasted a year, and it was

also carried out with 10th grade students. The researchers noticed that there is a positive relationship between extramural English and acquiring vocabulary and that this influenced males more than females since they focused on productive activities and spent more time playing games. The last study used extramural English with young students. In this research, 244 students from the fourth to the sixth grades participated. All students in the study had computers at home and an Internet connection which they could use. The findings showed that students spend 9.4 hours/weekly participating in extramural activities. However, boys are more connected with extramural English activities than girls as they spent 10.6 to females 8.4 hours weekly. It was shown that males are more readily learning vocabulary than females in all the studies. In this study, three groups of students of different ages participated. The first were sixteen to eighteen year-olds, the second fifteen to sixteen year-olds, and the third eleven -to twelve -year-olds. It was shown that the relationship between students and extramural activities is stronger if students are younger. But it must be taken into account that the researchers conducted the study with different ages at a different time.

Alsayegh (2016) found that digital games in language learning create a safe teaching context for students and teachers. This way leads to incidental learning and encourages the cooperation and interaction between students. In addition, it is said that this way motivates and challenges students. Finally, students will be able to create their own environment for learning since games make autonomous learners.

Purushotma (2005) argued that *The Sims* game can easily be modified by controlling the games language in order to develop L2. Giving explicit linguistic or grammatical instructions while or after playing is likely to be very significant in getting students' attention to the second language and will also connect content with the language of instruction. In addition, Peterson (2012b) studied students at ten universities who have learnt English while playing the game *Wonderland.* The results showed that games motivate students to learn and help them to communicate. Moreover, the participants claimed that playing games help them to improve their reading and writing skills in English.

Educational games should be attractive to students order to help them learn so they should be interactive (Denis, & Jouvelot, 2005). This is possible if games connect higher

order thinking with strategies, testing hypotheses and problem solving, instead of the traditional teaching methods that depend on memorizing and simple comprehension (Dondlinger, 2007).

2.2.7.1. Learning vocabulary with online games

Vocabulary acquisition is a very complex process. Students should know words' pronunciations and meanings, as well as their stylistic, morphological and syntactic properties in order to excel at the language. Online activities reduce this complexity and help students to learn better (Kalyuga et al., 2013; Kiliçkaya, & Krajka, 2010). Above all, Dörnyei (2007) stated that learning a language is very difficult and needs a good long-term memory and great effort. This language learning can only happen with online games if:

> The educational context provides, in addition to cognitively adequate instructional practices, sufficient inspiration and enjoyment to build up continuing motivation in the learners. Boring but systematic teaching can be effective in producing, for example, good test results, but rarely does it inspire a lifelong commitment to the subject matter. (p. 719)

In addition, Shahriarpour and Kafi (2014) stated that learning vocabulary is a very difficult and boring process and using online games makes leaning more interesting, so learners will be motivated and therefore learn better. Squire (2005) added that online games are a new type of e-learning and they have a great future as a hopeful learning technology. So, many researchers Prensky (2001b), Squire (2005), Whitton, (2010), and Zarina, & Hanafizan (2005) have given great attention to them in the context of education, whether they are used in the learning or teaching process. Moreover, Sütheő (2004) stated that in order to develop students' learning of a foreign language, teachers should hold students' attention, and this can be achieved with online computer games (Arslan, 2006; Donmus, 2010).

According to Ellis et al. (2006), using online computer games in education is similar to the scientific way of teaching because both of them engage students to learn by doing, solve problems, present hypotheses, answer questions and carry out tests. This makes online computer games one of the best ways of teaching and learning as they are not only helping students to learn vocabulary but also making them develop their skills such as problem solving, group working and independent working (Abrams, & Walsh, 2014). Moreover, online computer games give learners control, so they feel motivated and happy to learn.

Besides, the immediate feedback that students get from the game helps them to play and learn till they win the game and learn all the required information (Abrams, & Walsh, 2014). Also, online games make students more active which means more learning and they control their learning as the student-centered approach always requires (Lam, 2013).

It is reported that the use of online computer games has had noticeable advantages in learning vocabulary. Students' performance gets better since online games encourage students to learn words without asking them directly and on their own, they help students to spell words that they learnt correctly. In addition, they give students the power to try and to practice without fear of making mistakes unlike in traditional English classes. So, it is worth mentioning that students had used the new words, even more difficult ones in the game in order to get a higher score and as a result they will be able to produce their own text from the words that they had acquired during play. Also, online games reduce the number of unknown words and students become able to understand the comprehension text. Moreover, students are soon able to understand the text without using translation or even transferring knowledge and structure from their mother tongue. In other words, the use of transferring text from the students' language to the English language had decreased to 41% since the English structure has been clear for students from their use of online games and they apply them to all texts. In fact, 50% of students increase their ability to use skimming and scanning techniques which help them to understand meaning from the context (Dourda, Bratitsis, Griva, & Papadopoulou, 2014). It is said that games affect achievement, interest, task learning engagement and problem solving positively (Kim, Park, & Baek, 2009; Oyen, & Bebko, 1996; Robertson & Howell, 2008; Tuzun, Yilmaz-Sollu, Karakus, Inal, & Kizilkaya, 2008; Wideman, Owston, Brown, Kushnirk, Ho, & Pitts, 2007).

Moreover, many researchers used online computer games to teach vocabulary for many reasons: Sockett and Toffoli (2012) showed that students learn English vocabulary effectively when they are doing something else such as online activities, watching television or chatting online. Online computer games are connected with the internet and this encourages players to be in contact with each other and work individually or as a team (Bryant, 2007). Most players use the English language, so players communicate with each

other in English (Mawer, & Stanley, 2011). Students believe that these games help them to practice fluency in English (Peterson, 2012a) and players tend to learn the language to play which connects playing with learning (Thorne, 2008). They give students the chance to play wherever and whenever they want so this solves the problem of increasing student numbers and lack of facilities (Bryant, 2007). Online games teach different skills like strategy, team work and problem solving (Suh, Kim, & Kim, 2010). They are also updated regularly, and any choices players make in the game have an effect whereas in offline games there are no choices and players need to follow the designers' intention. It is also important to mention that they make the students' character do physical activities which motivates them to play (Whitton, 2010, pp. 38-39).

Ashraf et al. (2014) used several online computer games to help students to learn vocabulary and this was a very successful experiment since the results confirmed that online games enhance the learning of vocabulary and students' performance improves. Online games motivate students to play, learning vocabulary in order to win. Besides, games create interesting contexts where students collaborate with each other.

According to Markopoulos et al. (2016), students believe that online computer games allow them to learn anytime and anywhere. Also, they can choose the games that suit them. Moreover, this way of learning gives students the confidence in learning languages since their answers are synonymous. They can learn from their mistakes and correct them from the feedback that games give. Also, they help students to choose the appropriate level of difficulty for them, so all students will play at their own level (Kalyuga et al., 2013). Furthermore, teachers also have a positive opinion about online computer games as they make students' efforts more rewarding, games save teachers time and they give teachers the chance to organize their classes easily. Ashraf et al. (2014), Markopoulos et al. (2016), and Yip and Kwan (2006) concluded that using online computer games give teachers a role as facilitator and helper for the students which save teachers' energy and time. Also, learners acquire vocabulary easily because this creates a relaxing and interesting learning environment.

Students prefer to learn with online computer games for different reasons: they are not only fun, interesting and motivating but also they facilitate vocabulary retention, help students to revise vocabulary and remember it easily. In other words, students acquire vocabulary while playing games without realizing it. Students learn from their mistakes because making these mistakes requires the players to repeat the game from the beginning (Lam, 2013). Furthermore, online games develop social interaction and improve cooperative between learners. So, students become willing to spend more time learning with online games, and they are encouraged to learn as they discuss and interact with their classmates (Jong, Lai, Hsia, Lin, & Lu, 2013; Lam, 2013). However, Sørensen and Meyer (2007) argued that games not only help in memorizing words or giving correct answers, but they also help students understand content, as they make learning specific content easier (Gros, 2007), and they use different learning strategies (Sørensen, & Meyer, 2007). Additionally, Sørensen and Meyer (2007, p. 561) also pointed out that learning a foreign language with games "has been moving away from an association with drills, grammatical explanations and translation tests, into more communicative based contexts where task-based, project-based and content-based approaches are integrated".

Different experimental studies conducted about online games and English vocabulary show the importance of online games. A study by Calvo-Ferrer (2017) has stated that students who use online computer games in their learning get better result than students who learn using the coursebook and exercises. Similarly, Zheng et al. (2015) claimed that students acquire vocabulary with online computer games better than with coursebooks as they provide authentic contexts which help students to learn the language rather than learning about the language, and they engage students to learn. Teachers should encourage students to learn and this something online games can provide. They make students learn different skills like problem solving and linguistics action which they can use in real life. As a result, Rankin, Morrison, McNeal, Gooch, and Shute (2009) concluded that learning with online computer games leads to better learning of vocabulary and students feel more comfortable with learning.

Additionally, students themselves claim that online games help them develop their vocabulary skills. Another experimental study with kindergarten students by Segers and Verhoeven (2003) presented that when students play, their vocabulary improves. Moreover, better learning will happen by using online computer games. Learners agreed that games make them remember the new words that they learn besides practicing the language (Vasileiadou, & Makrina, 2017). A similar investigation by Sahrir and Yusri (2012) about learning Arabic vocabulary with online computer games reported that students believed that they learn vocabulary better with this tool. Similarly, from the evaluation process, it was clear that this way of teaching improves students learning of vocabulary and increases their concentration. Finally, this strategy is the most useful and effective vocabulary learning tool for elementary learners.

On the other hand, a study by Nahmod (2017) showed that learners who learn in the traditional way learn better than those who use the online game Kahoot. But the learners who learned with the online game displayed more excitement than the others. Different results were found by Vasileiadou and Makrina (2017) who claimed that teaching with computer games in general and online games in particular is crucial in primary schools. They create an enjoyable and motivating environment in which to practice English as a foreign language which leads to the effective learning of vocabulary (Kose, Cimen, & Mede, 2016). Also, they increase the intrinsic motivation for learners to learn, enjoy what they are learning and encourage independent learning (Perrotta et al., 2013). They make students live in a real-life situation related to their learning topic in the virtual world like travelling to a city to look for historical artefacts (Ellis et al., 2006).

In addition, they improve students' performance in vocabulary (Lin, 2014); increase learners' knowledge about the language and affect the language proficiency of players because playing or watching online games leads to better learning (Lin, 2014; Vidlund, 2015). They increase intrinsic motivation for students to learn, enjoy what they are studying, encourage independent education and become experts on what they are learning. When comparing the traditional way with online computer games, the advantages were greater for the online computer games as they help students to remember new words more than in the

traditional way (Kiliçkaya, & Krajka, 2010). For example, when using worksheets, students are not able to get immediate feedback while online games do give immediate feedback which motivates them to learn (Lam, 2013). However, the integration between the traditional teaching and online computer games will create a better learning and inexperienced learners can use games to achieve two purposes: the cognitive process associated with understanding how to play the game and the cognitive processes embedded in gameplay activities that correspond to domain specific learning goals. Additionally, online games make students learn independently and their results were better than those who depend on their teachers (Rankin et al., 2009).

In addition, Ashraf et al. (2014) stated in their study with Iranian students that online computer games play a very important role in vocabulary acquisition, they help students to share information and to learn new words easily. In a study with Arabs students in Jordan conducted by Baniabdelrahman (2013) claimed that students' achievement was increased in learning vocabulary by using online tools like games. The reason behind this is that games turn learning from theory into practice. Players are able to look for knowledge that helps them solve problems or find answers in context (Van Eck, 2006).

2.2.7.2. Learning vocabulary with Massive Multiplayer games

It was claimed that some students are addicted to massive multiplayer games and spend most of their free time playing them (Kim, Kim, Shim, Im, & Shon, 2013). Additionally, Paraskeva et al. (2010) added that students like to play action and role-playing games, such as MMOGs or MMORPGs and this should be taken into account when making educational games. Also, Linderoth and Bennerstedt (2007) claimed that, players contact each other in specific games like *massive multiplayer online games* (MMO) and *massive multiplayer online role-playing game* (MMORPG). It is mentioned that players work together to achieve game goals and they communicate with each other within the game or through the use of other interaction media which allows them to chat (Gee, 2007b; Lindh, 2009). However, this motivates them to produce language by writing and speaking and to consume language in reading and listening (Gee, 2007a; Sundqvist, 2009). Gee (2007a) added that MMOs and single-player games provide a very encouraging context for learning.

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In addition, MMOGs were identified by Steinkuehler (2004, p. 1), the researcher claimed that:

> Massively multiplayer online games (MMOGs) are highly graphical 2- or 3-D video games played online, allowing individuals, through their self-created digital characters or *avatars* to interact not only with the gaming software (the designed environment of the game and the computer-controlled characters within it) but with other players' avatars as well.

So, teachers can use multiplayer games as an excellent group work strategy in teaching vocabulary because the interaction between humans and learning is vital for successful foreign language recall and this can be created with computer games (Lin, 2014). This way also improves students' writing and speaking skills (Kim et al., 2013); and enriches students vocabulary (Bytheway, 2014). Rankin et al. (2006, p. 2) claimed that:

> An immersive learning environment that promotes the development of deep, conceptual knowledge of a particular domain by allowing players to experience the virtual world through sight, sound, participation and imagination, social interaction among players in support of reflective learning as players consider the consequences of their decisions and game outcomes, active learners who assume the role of the characters they have created and consciously commit to the advancement of these characters in the virtual world.

A previous study by Bryant (2007) found that MMORPGs are likely to be a good solution for learning English as they give students the chance to play with other students from other countries. Moreover, this way may allow students to practice English in a virtual environment as they chat and communicate with players who use English, and they can visit websites to share their interest and strategies outside the games with other players (Mawer & Stanley 2011; Steinkuehler, 2004).

Suh et al. (2010) added that this creates authentic learning in which students develop their English skills and knowledge. Besides, Bryant (2007) indicated that this way of learning solves the problem of space since large numbers of players can play online games at the same time (Loon, 2008). However, most game players tend to improve their English in order to develop their skills in games and interact with others (Thorne, 2008). On the contrary, online computer games that use multiplayers ought to be addressed as complex learning in regards to activity theory which shows that games connect subjects with each other and tools with objects and this is controlled by real rules which lead to shaping communities in which players in the same game play together and cause learning outcomes (Paraskeva et al., 2010).

A similar conclusion was given by Bytheway (2014) who thinks that learning via multiplayer games creates a complex context, and learning is affected by the games' culture and social situation.

According to Steinkuehler (2007), after studying games for two years, the researcher noticed that digital games engage players with many of the games' components which affect interaction and development. It is said that the MMORPG Lineage is a literary practice. In this, students will be able to use language in non-gaming contexts like writing a letter, creating oral narratives and watching the conversation in the game. However, digital games change students' role from passive learners to active learners and players. However, Shield (2003) claimed that the content of games, mostly war games- fighting evil unreal creatures makes them violent and not appropriate for the educational environment. With this in mind, Reinders and Wattana (2012, 2014) modified the game in order to use it. It was claimed that students communicate in oral and written activities during play but there was inaccurate language output because of the high overload of cognitive skills because players were required to play and communicate at the same time.

Many researchers have studied the effect of MMORPGs on students' acquisition of vocabulary. Peterson (2012a) used the *NineRift* online game with six undergraduate intermediate-level EFL students who study at a Japanese university, and this was their first-time playing MMORPG. It was found that players are more comfortable, they used the English language only and this helps them to practice which leads to fluency. Moreover, this creates an enjoyable environment which encourages them to use informal language with a sense of humor. In addition, Rankin et al. (2006) used a pilot study to investigate the effects of the game *Ever Quest 2* on five ESL students who are from high-level beginner to advanced level in English. This game helps students build their vocabulary as it creates an environment which is appropriate for learning. Moreover, this game helps students to achieve an intermediate level and develops their conversational skills. However, advanced and intermediate level students communicate with others and have a positive attitude towards learning whereas beginners experienced cognitive burden. However, Suh et. al (2010)

carried out a study with Korean students who studied using an MMORPG program. Those students had better communication skills and higher motivation than others.

Turgut and Irgin (2009) used the *Knight World* Online game with Turkish primary and secondary students who learnt English playing online computer games in an extramural environment. Students were motivated to play and learn for a great length of time, also they were able to use vocabulary that they had learnt within the games in non-gaming contexts. Similarly, Piirainen-Marsh and Tainio (2009) concluded that through playing the *Final Fantasy X* game in an extramural setting, students will be able to repeat and imitate the written and spoken conversation, and also use the language authentically.

In addition, *Ragnarok* online game was given to Thai students to play by Reinders and Wattana (2012). But the researchers modified this game to English, and it was put in a private server. This game helped students to communicate, and shy students became less anxious to participate. This was a very important tool since those students feel stressed when they speak but with games, they felt less afraid of communicating in English. In addition, Kim's (2010) study with elementary Korean students showed that low social effective values improved more than high ones. Rankin et al. (2006) used the *Ever Quest 2* online game which provides a realistic context in which students can practice language and interactive skills. Learners with an intermediate and advanced English level who play these games show a 40% increase in vocabulary. Moreover, the chat message between players increased 100% during eight sessions and playing this game also help in practicing the language and developing conversational skills. These results also corresponded with Zheng, Young, Wagner, and Brewer (2009) who found that the *Quest Atlantis* game increased the interaction and collaboration between native and non-native gamers which lead to more communication and exchange of language knowledge: semantics, syntax and pragmatics from and to native speakers. On the contrary, the results of a later study by Rankin, McNeal, Schute, and Gooch (2008) pointed out that students who learn in the traditional way fared better than students who learnt with *Everquest II.*

It is also said that the authentic and meaningful interaction is vital for language learning (Hall, & Verplaetse, 2000), which means input, interaction and output. However,

this type of interaction can be found in the interactive games which create a different environment for interaction. DeKanter (2004) argued that multiplayer games help students to interact and collaborate, as well as applying what they had learnt in real-world setting. Interactive games have three elements which make them appropriate for learning languages: adaptivity, competition and communication (DeKanter, 2004).

In 2007 the best-selling computer game was the *World of Warcraft* which is an online multiplayer game (Entertainment Software Association (ESA), 2008). And multiplayer games are still the favorite for students all over the world and 56% of gamers play them. This game is very popular, and it is very important in language acquisition since it makes players communicate in English *(*Waters, 2007). So, many researchers have used it in their teaching (e.g. Bytheway, 2011; Coxhead, & Bytheway, 2015; Thorne, 2008).

One of the primary investigations with the online game *World of Warcraft* was done by (Thorne, 2008) who utilized this game in an informal and extramural environment. A case study was applied in order to find true information about how players communicate with each other while playing, and what language they use. Two groups of students participated in the study: Ukrainian and North American gamers. This indicated that this game gives students an environment in which they are encouraged to communicate and to learn and use the language productivity and receptively. Moreover, Rama et al. (2012) argued that using WOW with Spanish language students who had different a gameplay experience, created an appropriate environment which encourages communication and collaboration with players since online computer games foster the use of the four skills during play: speaking, reading, writing, and listening. Rama et al. (2012) concluded that "MMORPGs show great promise as a second language pedagogical tool, provided game designers leverage the benefits of MMORPGs for SLA (second language acquisition)" (p. 47).

In another experimental study by Zheng, Bischoff, and Gilliland (2015) with Japanese undergraduate students who played the online computer game *World of Warcraft "WOW"*, it was shown that this game helps students to learn vocabulary which is related to the game itself. It engaged students in the learning of the language in general and how to use the language in real life contexts in particular. Moreover, *WOW* can be used to foster learning.

Thorne (2008, p. 323) found that "for many students across the world, performing competent identities in second and additional language(s) may now involve Internet-mediation as much as or more often than face-to-face and non-digital forms of communication". Moreover, this game makes students use what they have learnt in the game outside the game and in real life, but this depends on the amount of playing time and the players experience during playing (Scholz, 2015).

Coxhead and Bytheway (2015) argued that playing MMORPGs in general and *World of Warcraft* in particular makes students motivated to play games for more than 30 hours a week They connect students with the language and they have the chance to repeat unfamiliar words which in turn makes them familiar. This is affected by the language that learners observe, and the amount of time they spend playing games. The language that they produce and use in the games needs to be practiced to achieve fluency which means that students who play often will be able to use the language without fear or anxiety of making mistakes in spelling or in conversation. Additionally, anxiety decreased while using the foreign language in WOW game (Bytheway, 2014). The most important thing is when students are able to discuss their experience in the classroom which turns the vocabulary they have learnt in the game into vocabulary they use. Also, Zheng, Bischoff, and Gilliland (2015) claimed that using WOW with Japanize students provided an appropriate environment for learning vocabulary.

It was claimed that in games, vocabulary learning strategies are influenced by play, motivation and culture. And this clearly impacts players' interaction, curiosity and independent learning while playing WOW. Moreover, this also affects students' language usage, attitudes and the strategies that they use. However, educators and teachers "need to value MMORPGs as contexts for learners' vocabulary learning strategies…" Bytheway (2011, p. i). Bytheway (2014) discussed that the WOW game motivates students to learn and to use the language as it creates a comfortable and relaxed setting to interact and collaborate. Moreover, students using this way can watch other players, read the information which is found in the game, turn picture and actions into words and use the dictionary or the Internet to find the meaning for some new or difficult words.

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However, when investigating the influence of games, researchers should focus on the type of games and the amount of time played. What learners learn with games is very important as they improve proficiency in language and develop the learning outcome and increase students' knowledge (Sundqvist, & Sylvén, 2012).

To sum up, most of the previous studies (e.g. Ashraf et al., (2014), Baniabdelrahman (2013), Kiliçkaya and Krajka (2010), Kose et al. (2016), Lam (2013), Lin (2014), Markopoulos et al. (2016), Peterson (2012a, b), Rankin et al. (2009), Vidlund (2015), Yip and Kwan (2006), and Zheng et al. (2015)) focused on using digital games in learning a second or foreign language but with vernacular online computer games. However, some studies used MMOGs (e.g. Bytheway (2011, 2014), Coxhead and Bytheway (2015), Rankin et al. (2006), Reinders and Wattana (2012), Steinkuehler (2007), Suh et al. (2010), Turgut and Irgin (2009), Thorne (2008), Warschauer (2012), Zheng et al. (2015), Zheng et al. (2009)). Whereas, a few studies used educational online computer games with young students such as Ashraf et al. (2014) who used online educational games with sixteen to twenty-one-year old Turkish students. On the contrary, Kim (2010) applied multiplayer games with elementary Korean students, and Turgut, & Irgin (2009) with Turkish primary school pupils. However, some studies were conducted in the Arab word but with offline digital games like Qteefan (2012) with 5th grade Palestinian students, Alsayegh (2016) with Saudi university male students, and Baniabdelrahman (2013) with 10th graders in Jordan.

2.2.8. Factors that affect learning with online games

Rankin et al. (2008) pointed out that before choosing a game to use in the classroom, teachers should focus on three main things: players' identity, social interaction, and the games' context.

With regards to players' identity, Wang (2010) found that it is important to notice students' different backgrounds, learning styles, needs, and expectations in order to make learning with games beneficial. It was added that the usefulness, easy use, learning opportunities and personal experience in video games should be studied with regards to gender (Bourgonjon, Valcke, Soetaert, and Schellens, 2010). Uuskoski (2011) argued that

the types of games, and how long learners play them affect English proficiency. Furthermore, learners who play over 15 hours a week have better grades in English than those who play less or do not play at all. After studying some of them and their effects on learning languages, the study showed that role playing games followed by massive multiplayer online games, strategy and shooter games were the most important in terms of getting good grades. But it is difficult to decide which one influences students more, the playing time or the type.

Chen and Johnson (2004) used a commercial game *Neverwinter Nights* to confirm whether games can motivate gamers to practice language skills outside the classroom. Participants had varying amounts of experience in playing games and this influenced their success in playing. In addition, students who had experience feel more comfortable when playing and finishing a task in the game does not take them long. They also enjoy playing more than others. Therefore, the researchers recommended that training should be given to decrease the differences between students while conducting research and to motivate students to succeed more in playing and acting on their errors to achieve success.

Peterson (2012a) and Rama et al. (2012) concluded that students who have a little or no experience in playing games find difficulty in coping with the game even with a good language level as they need game skills. Also, a study by Sundqvist and Sylvén (2012) showed that weak learners do not participate in playing games.

Another factor that affects using games is learners' age. According to Väisänen (2018), younger players believe more in the positive influence of using video games in learning than the older players. While Mayer (2014) has an opposing idea which states that adults and college students were affected positively by video games whereas elementary students were not affected at all. Besides the previous factors, the students' level in learning is a very important point to consider. Video games do not improve weak learners' communication skills although they do attract their attention (Reinders and Wattana, 2012).

There are other factors that affect students' learning when using online games. The first is being overwhelmed by the cognitive content of the games. Secondly is the different language quality that players produce and the dearth of correcting mistakes (Peterson,

2012a). Also, students will not be motivated to play and to learn if the games are not appropriate for them. Furthermore, students may think that they should learn only when they are motivated externally since games give external motivation like money, badges, and praise. Lastly, most of the games can be played individually so this may affect social interaction negatively (Lam, 2013). Nevertheless, motivation and encouragement are not enough to consider games "good"; educational games should be well-designed in order to develop the students' social and cognitive sides and improve students' learning (Gros, 2007). Additionally, O'Neil, Wainess, and Baker (2005) stated that if games are not well designed, players will not be attracted to play them. Well-designed games are motivating and fulfill players' expectations.

So, teachers should take many things into consideration while using online games in their classroom: they should not focus on the game itself because it is a teaching strategy. What they should focus on is how they can benefit from this game (Jong et al., 2013), and how they can use them carefully without relying on them completely because their effects are not yet clear (Perrotta et al., 2013). Finally, the use of online computer games in schools depends on three factors: the technological factor which means "Computer access", the second factor is the learning procedure and the last is human nature "the students and the teachers" (Markopoulos et al, 2016). Teachers should have the time and the resources to use online games in their classes (Perrotta et al., 2013). The differences between gender, game use, game advantages, the relationships with the game's characters, and the psychosocial factors which affect learning like academic performance, self-esteem, and computer self-efficacy, should all be considered when choosing or developing games for educational purposes as they affect the learning outcome (Paraskeva et al., 2010).

However, the teachers' role here is to plan their classes correctly to be able use online computer games, and they should always develop themselves and stay updated with online games and how they can utilize them in the learning and teaching process (Ashraf et al., 2014).

2.2.8.1. Video games and gender variable

The gender variable has a huge influence on the use of video games in education and gives rise to the good or bad effects of video games on students' learning. Gender affects game preferences and the amount of time gamers play games.

Sundqvist (2009) added that gender not only affects the playing time but also the type of games students play. Boys and girls prefer to use different games, boys like *World of Warcraft (WoW)*, while girls prefer (The Sims). Moreover, boys spend more time on games than girls do, and they go through English games more than females. Males perform better than females in vocabulary whereas females perform better in languages in general than males. In a recent study by Erkkilä (2017) with Finnish upper secondary school students. The results showed that 92% of students play digital games and most of the students who do not use games are girls. 279 of 701 students (39.8 %) use digital games almost every day. Students answered that digital games help them to practice the language and use it.

Males play games more than females. 33% of males and 13% of females do so every day (Facer, Sutherland, Furlong, and Furlong, 2003). In addition, Yee (2006) reported that the majority of players who are under 18 years old are males (96.8%). ESA (2018) indicated that 61% of gamers are males and 39% are females. In addition, 17% of males and 11% of females are under 18 years old. However, the average age for female players is 36 years old and for males it is 32 years old.

According to Yee (2006), males and females have different reasons for playing games. Male gamers like playing MMORPGs for the achievement and manipulation factors. Whereas, females use of MMORPG is affected by the relationship factors. Girls play to build social life and to escape their real lives to a more imaginary world.

Griffiths (1996) argued that there are more male players than females, not because of the limited interest of females to play but because games are designed for males. Cassell and Jenkins (1998) stated that a games content and nature are what affect gender differences in playing since computer games reflect males' prospects for the world. However, females like

games that have fun characteristics like puzzles and quiz games which most of the time compete with the computer (Mitchell, 2003; Griffiths & Hunt, 1995).

Many studies showed that males play video games more than females and their performance is also better (Brown, Hall, Holtzer, Brown, and Brown, 1997). Related to this, a study by Erkkilä (2017) who viewed that playing digital games help students to practice the language and learning with digital games influences male students more than females and they believe more than girls in the benefits of video games on learning the English language. 63.6% of boys speak English while playing video games, whereas only 17.9% of girls speak in English. Similar results by Sundqvist and Sylvén (2012) claimed that males who play MMORPGs got better results than females who play offline games and single player games. Also, Shahrori and Rimawi (2011) agreed that digital games affect problem solving skills, memorization and decision taking positively, but they affect male students more than females.

On the contrary, a previous study by Shen, Ratan, Cai, and Leavitt (2016) found that after they conducted a comparison study between girls and boys using MMORPGs that there is no gap between males and females in using digital games and this stereotype is incorrect and this affects females and their participation in digital games activities.

According to Lucas and Sherry (2004), there are significant differences between males and females in playing video games. First of all, young men play games more than women. Secondly, young men are more motivated by social interaction during playing video games than young women because men usually play more so they spend more time with peers. Thirdly, both women and men are encouraged to learn by completing challenges but males like playing competitive games whereas girls dislike them and prefer challenging games. Finally, young women do not like mental-rotation games in which players mentally move things around, and they prefer non-mental-3D rotation games while males prefer imaginary and mental-rotation games. Ferguson, Cruz, and Rueda (2008) added that visual memory for men could be developed by video games more than females.

The most important thing about using video games is to utilize what fits students' needs and abilities and they should be appropriate for both genders. Moreover, the previous studies by Butler, Someya, & Fukuhara (2014), Mifsud, Vella, & Camilleri (2013), and Vahdat, & Behbahani (2013) have similar points of view to Shen et al. (2016) that gender does not bring about differences in applying video games.

On the other hand, many other studies showed that there are indeed significant differences between males and females in utilizing video games. Boys prefer to use group games like MMORPGs; whereas, girls like single-player games. these differences in students' interests may affect their motivation and therefore their learning (Sylven, & Sundqvist, 2012). In addition, game types affect motivation as boys prefer military games and this type of game attracts their attention, while girls do not feel engaged with those games (Anderson, Reynolds, Yeh, and Hung, 2008).

Video games themselves are considered to be the reason behind gender differences in playing them since most games have inappropriate content (e.g. negative stereotypes and violence) which makes the number of female players smaller than the number of male players (Agosto, 2004; Hayes, 2005; Jones, 2005; Ray, 2004; Valenza, 1997; Xeniya, 2015) and this can only be solved by removing sex (and racial) bias (Agosto, 2004; and Mou, 2007). Besides, games' design is another reason for girls not playing games (Agosto, 2004; Hayes, 2005; Jones, 2005; Ray, 2004). As a consequence, Dickey (2006), and Hayes (2005) indicated that designers need to create video games for females only to increase the number of female players. However, males are more familiar than females with video games as a tool as well as the gaming environment and this has been seen as an advantage for males (Daviault, 2000).

Therefore, what makes males better than females at playing video games? According to Ferguson, Cruz, and Rueda (2008), the main reason for the differences is the visuospatial ability (the visual perception of the spatial relationships of objects), which means that males have a greater ability to recall visual memory. Also, they outperform females in violent video games. Besides, playing video games minimizes females' ability to concentrate and to apply previous information during play (Reese, 2007). Similarly, Jones (2005) pointed out that as

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girls do not have much experience in playing computer games, so they do not learn very well. As well as this, they do not have the necessary skills, and this harms their abilities to draw on previous knowledge. To summarize, they are concentrating too much on learning how to play rather than using the English. So, they cannot "achieve goals, develop strategies, and cooperate in groups while competing" (p.2).

In short, teachers are responsible for keeping balance when using games in classroom to benefit both sexes (Kappers, 2017) and gender should be taken into consideration when using or designing games for an effective outcome (Paraskeva et al., 2010).

2.2.9. The obstacles that face the using of online computer games in schools

There are different obstacles that face using video games in education. Baek (2008) stated that learners are still not ready to use them, and the current curriculums are not flexible. Kirriemuir and McFarlane (2003) added that the lack of budget for games licenses and the hardware besides the dearth of the supportive materials for teachers is a factor.

Moreover, teachers and parents are one of the main obstacles that face the use of online games. Teachers' opinions towards the strategies that they use in the classroom play an important role in their choices. Most teachers hold a negative perspective towards games and they consider them to be a violent product and a waste of time. Also, they believe the negative studies about the influence of digital games on students' behavior (Chik, 2012; Chuang, & Chen, 2007). Moreover, people who have had no experience in playing games write negative comments about the use of games in education (Rice, 2007).

Parents, teachers and even students are often against computer games and they consider them the reason behind low academic achievement despite the positive influences they are shown to have had (González, & Izquierdo, 2012). However, Griffiths (2002) agreed that videogames have negative effects on children but when they are used for educational purposes, they have lots of benefits like engaging students in learning, and teachers being able to assist students. Also, videogames attract participation by individuals across many demographic boundaries (e.g., age, gender, ethnicity, educational status). However, statistics by Essential facts ESA (2015) on computer games indicated that parents' thoughts have

changed and 63% of parents now think that games have a positive influence on their children. 75% of parents agreed that playing games with their children creates a good chance to communicate and connect with them.

Besides this, teachers who do not usually play games consider games in teaching English an unremarkable issue (Chik, 2012, pp. 100-101). Moreover, most teachers do not know how to use computer games in the classroom, and they have a lack of knowledge about them (NEFR, 2009). At the same time, Kappers (2017) has found that although it may be useful, teachers do not need to have a high level of experience. It is more important for them to be familiar with the implementation of the tools that they use and how to plan for them since this is the most significant thing in education which lead to positive outcomes.

Also, video games are unsuitable for young learners because of their commercial aim (Chik, 2012). Moreover, a study by deHaan, Reed, and Kuwada (2010) reported that learners find some difficulties in playing games in the classroom.

There is little guidance about how to use video games in teaching and a small number of games have been tested and their suitability approved when it comes to learning outcomes. This means that games should be chosen carefully, and they should be tested before use in the classroom (Bertozzi, 2014). Yılmaz (2015) found that games help students to learn but there are not enough games for educational purposes and most of the games are for entertainment. So, there is a need for a collaboration between educators and the games industry to produce appropriate games (NEFR, 2009), and to design more games and programs for students (Yılmaz, 2015). But it is not easy to create a program for this purpose. Therefore, software programmers should create more programs to help students learn languages (Ahmad, & Jaafar, 2011; Yılmaz, 2015).

Using online computer games is not easy because many teachers are not familiar with games. There is also a lack of time in the class, it is difficult to persuade parents, stockholders, head teachers to allow their use in the class. Besides, the high cost of buying games is one of the most important problems that face the use of games in the classroom (Ellis et al., 2006).However, Rice (2007) argued that educators can overcome the abstractions that affect the applying of video games if they solve these problems: the lack of classroom

time, games graphics quality, and teachers representing the learning objectives in an inconvenient way when applying video games in the classroom.

Also, a vast number of games are commercial and vernacular so, many researchers have shown the need for more educational games (e.g. Ang, & Zaphiris, 2006; Neville, Shelton, & McInnis, 2009). This was explained by Ito (2008, p. 114) that "as the development context shifted from a small, experimental research effort to a mainstream commercial enterprise, the founding impetus of educational and cultural reform shifted to one of catering to existing institutional and market demands".

It was argued that digital media gives the chance for all students to participate (Gee, & Hayes, 2011). Chik (2012) added that this helps to see the real meaning of language learning while playing digital games and doing gaming activities. However, language teachers who adhere to the school curricula and traditional teaching methods are unlikely to be able to use games.

Despite the popularity of digital games, they are not yet used as a tool for learning foreign languages Moreover, teachers are responsible for choosing and using appropriate games (Lacasa, Méndez, & Martínez, 2008). What makes teachers choose the right and suitable games is their familiarity with them so they will be able to imagine its pedagogical benefits (Chik, 2011; Santo, James, Davis, Katz, Burch, & Joseph, 2009; Schrader, Zheng, & Young, 2006). Clearly, this shows that the obstacles in implementing the digital games comes as a result for teachers' limited experience. This was improved on by Chik (2012) who found that two out of 34 teachers played online games and five teachers have games' consoles. While the others have very little information about games, and think that they are violent, commercial and time wasting. Also, teachers still don't know the real advantage of online games (Ray, Powell, & Jacobsen, 2015), and they have mixed opinion of them, whether they are a bad or a good tool (Bourgonjon et al., 2013). Also, they don't know how to utilize them in classroom (Ray et al., 2015).

CHAPTER III

METHODOLOGY AND PROCEDURES

3A. Contextualization (Palestinian context)

In the first part of this chapter, the researcher gives some information on the setting of the research which is Palestine. The Palestinian case is very complicated, and it needs a clear explanation because this country is unlike other developing countries since it is also occupied. To be clear, this information is given to help readers better understand the situation. Throughout this chapter the researcher gives some details about Palestinian education, English language teaching in Palestine, Palestinian teachers and students and what affects Palestinian education. Finally, this chapter focuses on ICT in Palestine and the possibility of using it with students in Palestinian schools. In addition, in the second part of this chapter the methodology and procedures were discussed.

3.1. A brief introduction to the teaching of English in Palestine

In this section, it is crucial to mention how English was introduced in Palestine and into Palestinian academic institutions, giving a more comprehensive picture of the condition of English language teaching in schools and the education situation in general.

Readers should note that "theoretically" when talking about Palestine, this means the West Bank, Gaza and East Jerusalem. Although East Jerusalem is still annexed, education is administered by Palestinian Authorities. But in this chapter the researcher investigates only the West Bank and the Gaza Strip because of the difficulty in collecting data from Jerusalem.

The special Palestinian political situation makes education the most important aim for Palestinians since it is a tool for socio-economic development and is used to avoid political exclusion (Barakat, 2007). In this regard, English is part of the education system and it is affected by social aspects which encourage students to study it since it is considered to be the "window to the world". With this in mind, Dajani and McLaughlin (2009, p. 44) indicated that:

> Curriculum developers, policy makers, teachers and parents would like Palestinian children to learn English from early stages since the English Language is the language of science and technology, a fundamental tool for pursuing higher education, and a means for communicating with a wider community.

After the First World War, Palestine was under the control of the British Mandate and English was introduced as a formal language so Palestinians have studied English since

1920 (Dweik, 1986; Amara, 2003). Then, Israel came into control of Palestine and this caused the ongoing Palestinian-Israeli conflict in 1948. As a result, Palestine was divided into two areas: the West Bank that followed the Jordanian Kingdom and their education system and their curriculum, and the Gaza Strip that followed the Egyptian education system. In both systems English was taught from the 5th grade.

Things changed in 1998 when the Palestinian Ministry of Education created the Palestinian curriculum and English was introduced from the first grade by using the *English for Palestine* curriculum (Dajani, & Mclaughlin, 2009). And the main aim of this curriculum is international orientation since learning and teaching the English language is crucial for the Palestinian identity in the world (Amara, 2003). It also focuses on the learners' ability to "communicate freely and effectively in different situations and settings with native and non-native speakers" (English Language Curriculum Document, 1999, p. 5).

There are three main reasons for the learning of English in Palestine. Most importantly, as a result of the Palestinian situation after 1948; millions of Palestinians live as refugees after they were forced to leave their homes. Also, many emigrated to other countries to look for a better education, living situation and jobs. Besides, the foundation of many International media and human organizations in Palestine which became part of the Palestinian lifestyle (Musleh, 2010, p. 113) required people to have a good level of English. So, this gave rise to English as the first foreign language in Palestine. Palestinians study it from the first grade up to university studies. Moreover, English has become the language of many university specializations from medicine to economics (Tushyeh, 1990).

However, due to obstacles in practicing English regularly, Palestinian students like their Arab counterparts find a great deal of difficulty in learning English. Arab students face many difficulties in learning the four skills of English. This has come as a result of the students' mother tongue being spoken in the classroom and the lack of input in their language teaching. Also, Arab students face many spelling, pronunciation, lexical and semantics problems (Jdetawy, 2011). Moreover, Ansari (2012) stated that the main reason for the weakness in English language for Arab students is the language part which depends on vocabulary, so teachers should focus on vocabulary to help students learn English

effectively, and to use words in context to help with vocabulary retention. However, Palestinian students focus on learning English primarily to pass exams particularly the *Tawjihi'* orientation exam (Fennell, 2007).

3.1.1. English for Palestine

In 2000, the Palestinian curriculum "English for Palestine" was introduced in schools from the first grade up to the twelfth grade. This curriculum has been written and developed by local and international ELT experts and follows the Ministry of Education syllabus.

These course books are aimed at developing students' systematical skills and grammar. They also contain age-appropriate activities that motivate and reward students such as games and songs in order to develop the students' learning experience (English Language Curriculum for Public Schools Grades 1-12, 2015).

English for Palestine from the 1st to the 10th grades consists of 18 units. Each unit introduces a specific topic and new related vocabulary which students learn within a context. The course books can be classified into three categories: Lower Primary Level (Grades 1-4) Upper Primary Level (Grades 5-10) and Secondary Level (Grades 11-12). The course books from 1-4 grades contain the same unit titles but in each grade new and more complicated vocabulary is introduced (Ministry of Education and Higher Education, 2014). The unit titles in the textbook are: All about me, He's a doctor, At the market, At the zoo, Revision , I don't feel well, My day, It's sunny, Revision , What's the time?, At the playground, Open Day, I'm wearing a scarf, Revision, They're jumping! , I'm Palestinian, My favorite and Revision (English for Palestine teachers book 3, 2011).

It is worth mentioning that this curriculum focuses on the core lexicon in Palestinian schools which is 1800 words (2100 including Reading Plus books) where a lexeme represents a word family. It is organized as follows: Lower Primary Level (Grades 1-4) approximately 450 words; Upper Primary Level (Grades 5-10) approximately 1100 words; Secondary Level (Grades 11-12) approximately 240 words (500 including Reading Plus books) (English Language Curriculum For Public Schools Grades 1-12, 2015, p. 115).

The general aims of *English for Palestine* for 3rd grade students are: to develop vocabulary, learn simple grammatical structures, engage in meaningful activities, use numbers in practical activities, and to increase children's abilities in the four skills (listening, speaking, reading and writing) (English for Palestine teachers book 3, 2011).

3.1.2. Education system

Schools in Palestine can be divided into the following: schools under the supervising authority, schools related to the stage of learners, and schools related to gender. The main education service providers in Palestine are State-run, private and UNRWA[1] schools (Ministry of Education and Higher Education (MoEHE), 2014).
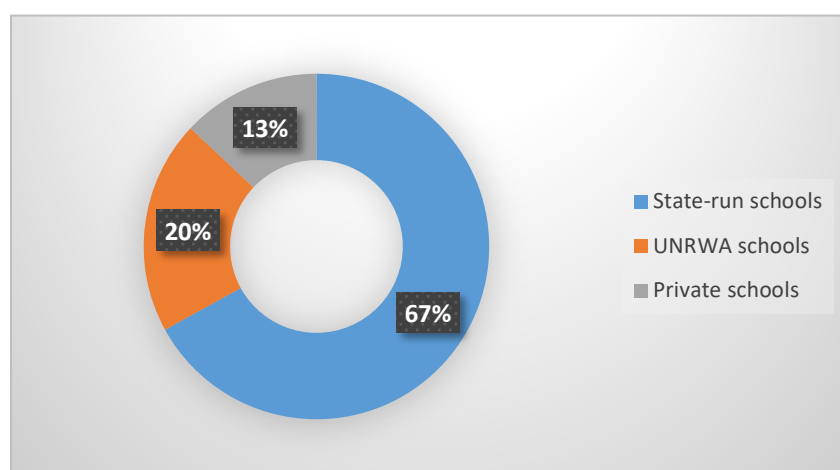
Figure 25. Distribution of Classes by Supervising Authority (MoEHE, 2018)

As shown above, the main education provider in Palestine is the state-run schools, followed by the UNRWA schools.

There are three sub-sectors of education system: pre-school education, elementary schools, secondary schools Non-formal Education (NFE) (MoEHE, 2014). Additionally, the average number of elementary level students per class in Palestine is between 27.6 students in the state- run schools, 23.1 in private schools and 33.6 in UNRWA schools (PCBS, 2017).

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[1] UNRWA is the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) is a relief and human development agency (https://www.unrwa.org)

In addition, according to MoHE (2018) schools related to gender are divided into boys' schools, girls' schools, and co-ed schools. But the number of co-ed schools is fewer than the others especially in governmental schools as shown in the table below:

Table 2

Distribution of Schools by Supervising Authority and School Gender, 2017/2018 (MoHE, 2018)

All authorities	Schools gender	Private	UNRWA	Government
	Co-ed schools	350	101	518
	Female	30	117	826
	Male	45	152	859

According to the Palestinian system, students in elementary schools take 4 classes of English weekly which is a total of 160 minutes of English in public schools and 240 minutes in private schools. English is taught simply as a school subject and students learn from teachers' instruction in the classroom. Arabic is the language of instruction so it is not easy for them to learn English (Musleh, 2010).

3.1.3. Palestinian teachers and students

Teachers are one of the most important elements that affect the education system. So, it is important to study the Palestinian teachers' situation since teachers' performance and students' understanding are connected.

Palestinian teachers are less motivated to be creative because they suffer from poor work conditions; crowded classrooms; lack of administrative and supervisory support; strict traditional assessment techniques; and poor social status and low salaries. Additionally, there are heavy workloads (teachers give 22-27 classes a week) (Khaldi, & Wahbeh, 2002; Kouhail, 2004; Pacetti, 2008; Shehadeh, & Dwaik, 2013). Palestinian statistics show that the average number of students per teacher is 20.9 students in governmental schools, 30.9 in UNRWA schools and 16.9 in private schools (PCBS, 2017). Crowded classes not only affect negatively teachers but also students' learning. In addition, most teacher training programs concentrate on theories instead of real practices which make this training useless (Qattan

Center for Educational Research and Development (QCERD), 2001). In addition, the lack of facilities, resources and materials are other factors which affect education negatively (Dajani, & McLaughlin, 2009).

Above all, the Israeli practices on Palestine are one of the main factors that affect teaching and learning (Kouhail, 2004). To be clear, Palestinian teachers and students live in a war-zone which forces a large number of teachers and students to go through military checkpoints and electronic gates daily in order to reach their schools, and as a result students and teachers are often late or unable to attend (Fennell, 2009; Nasser, & Wong, 2013; Nicolai, 2007; Stop the Wall: The Palestinian Grassroots Anti-Apartheid Wall Campaign, 2007; Yamchi, 2006). Also, Israeli practices against human rights make teachers and students feel insecure and unprotected (MoEHE, 2014, p. 19). Because of this, they suffer from psychological, social and disciplinary problems and they are easily distracted (Khaldi, & Wahbeh, 2002; Kouhail, 2004; Wahbi, 2000). However, the above challenges could be solved by using IT in education like video conferencing, distance learning and e-learning as a supplementary tool. But even this is under Israeli control so it is not always available and reliable (Shraim, & Khlaif, 2010).

Despite the previous points, Palestinians are considered to be the most educated people in the Arab world (Mikki, & Jondi, 2010; Nicolai, 2007), and 96.9 % of Palestinians are literate (PCBS, 2017), because they think that education is their only weapon to survive. Therefore, Palestinian education aims to:

> Prepare human beings who are proud of their religious values, nationality, country, and their Arab and Islamic culture; who contribute to the development of their society; who actively seek knowledge and creativity; who interact positively with the requirements of scientific and technological development and who are capable of competing in scientific and applied fields; who are open to other cultures and regional and international markets; who are capable of building a society based on equality between males and females and upholding human values and religious tolerance; and build up a higher education system which is accessible, multiple, diversified, flexible, effective, efficient, sustainable competitive and qualitative. (UNESCO, 2011, p. 48).

3.1.4. ICT in Palestine

> ICT can empower the Palestinian education system if students' and teachers' roles are reconceptualised to make them active agents participating in meaningful learning. Literacy in this model includes more than just general and technical skills (Wahbeh, 2006, pp. 45-46).

ICT is still in its infancy in Palestine: "[a]ccording to the MOE reports, 40 percent of schools have (2109) computer labs (13 computers in each lab), while a small percentage of these labs are connected to the Internet" (Wahbeh, 2006, p. 3). Beside this, most computers in Palestinian schools are old and computer labs are only used in computer classes (45 minutes/week). In addition, teachers are reluctant to learn how to use them. In fact, real computer use is in students' and teachers' homes not in schools and their abilities are based on how they use it and for what aim (Pacetti, 2008). Table 3 shows that Palestinian people have lots of ICT tools at home and they are interested in technology.

Table 3
Percentage of Households Who Have ICT Equipment a Home by Region, 2017 (PCBS, 2017)

ICT Equipment	West Bank	Gaza Strip	Palestine*
Computer Desktop	19.9	9.0	15.6
Laptop	31.6	22.2	27.9
Tablet	19.8	14.3	17.7
Smart Phone	89.8	75.5	84.2
Internet at Home	60.6	38.0	51.7

Overall 85.7% of Palestinians use the Internet to access information, 49.3% for education, 69.1% for communication and 79.3% for entertainment (PCBS, 2011).

With regards to schools and education, a new survey by MoHE (2018) showed that the number of computer labs has increased in Palestinian schools. 88.48% of Gaza Strip schools have one while 73.91% of the West Bank schools do. Despite the high percentage of computer labs, the number of Students per Computer is very high as shown in the following table:

Table 4
Distribution of Average Number of Students per Computer by Directorate and Supervising Authority, 2017/2018 (MoHE, 2018)

computer	Private schools	UNRWA schools	State-run schools
West Bank	16.5	20.3	15.8
Gaza Strip	17	62.9	53.5
Salfit	10.8	-	13.5
Palestine	16.5	47.8	20.3

The city where the research took place has lower than average number of students per computer at 10.8 compared to 16.5 in private schools and 13.5 to 20.3 in state-run schools as the Palestinian average.

In addition, most Palestinian schools have internet connection as indicated in table 5 below:

Table 5
Percentage Distribution of Schools which are connected to the Internet by Directorate and School level, 2017/2018 (MoHE, 2018)

Directorates	Secondary schools	Elementary schools
West Bank	96.3%	86.7%
Gaza Strip	98.6%	99.6%
Salfit	100%	90.2%

A previous study on improving English in Palestinian schools recommended teachers to apply different material and to utilize more technology in the classroom in order to promote independent learning (Aqel, 2009).

In conclusion, Palestine could be a very successful story in regard to using online computer games since they have the equipment and the internet. However, teachers need practical training courses that fulfill their needs since teachers said that the training courses that the Ministry of Education provide are mandatory for teachers but they are not useful and are irrelevant to their needs (Wahbeh, 2003).

3B. Methodology and procedures

The second part is devoted to specifying the steps and the methodology that carrying out the study endeavor. This chapter is divided into six sections. It presents the research population and sample, instruments, and their validity and reliability, the process of collecting data, and statistical analysis of the data.

3.2. Research methodology

This is an analytical descriptive piece of research which uses quantitative research methods to achieve the study's purpose.

Descriptive research includes surveys and simply describes the result without any control over the variables and without comparison and correlation. Whereas in analytical investigations researchers use the available information and analyze it to give a critical evaluation (Kothari, 2004).

Quantitative research methods are the most common methods used in social and educational studies. Dornyei (2001, p. 192) defined quantitative methods as follows: "possible and numerical directly quantifiable data are collected to determine the relationship between these categories, to test research hypotheses and to enhance the aggression of knowledge". This method uses variables and statistics techniques to explore the relationships between them, (Leedy, 1993; Punch, 2013) and through data analysis, hypotheses from a theory which is tested. Quantitative researchers attempt to find cause and effect relationships in order to find possible predictions and generalization. The most important thing is to achieve validity and replicability of the findings, the phenomena of interest is studied from a distance and with neutrality (O'Dwyer, & Bernauer, 2014).

Moreover, for social psychological cases quantitative methods are used to find reasons for human behavior. This can be studied by using hypotheses and testing them using experimental or non-experimental-research design (Tajfel, & Fraser, 1978). They can be tested by applying a combination of more than one quantitative method. In this research two quantitative tools were used: experimental and non-experimental. When using two tools, researchers should bear two aspects in mind: how to use them and how to incorporate date

(Moran-Ellis, Alexander, Cronin, Dickinson, Fielding, Sleney, & Thomas, 2006). Rationales focus on the validity of data or analysis and are used to see the full picture of the study (Mason, 2006). Moreover, the validation rationale helps to avoid bias (Monrad, 2013) and similar results from both tools mean accurate information (Moran-Ellis et al., 2006). Above all, according to Mason (2006), this helps researchers to study complex social experiences and life realities.

Experimental design seems to be fundamental in social studies. It analyzes the influence of conditions that researchers apply to behavioral outcomes and interests. Dependent and independent variables are used, and the experiment is executed under tight control of the independent variables. The benefits of experimental design lie in ensuring three preconditions for establishing causality, namely, temporal precedence, co-variation of the cause and effect, and the exclusion of alternative plausible explanations (Trochim, & Donnelly, 2007). However, the result of the experiment cannot be generalized due to the differences between internal and external validity. This only occurs by doing field experiments (Dipboye, & Flanagan, 1979).

It seems that most researchers who studied applying online or offline computer games to the learning of vocabulary use the experimental method (e.g. Ang, & Zaphiris, 2006; DeHaan, 2005; Johnson et al., 2004; Turgut & Irgin, 2009; Vahdat, & Behbahani, 2013) as it is the only way that gives researchers information about the effect of one teaching strategy on the students' learning of foreign languages.

The other tool in this study, which is non-experimental, is the survey. The survey here is the questionnaire which was used to collect data about teachers' beliefs and perspectives. It allows participants to provide opinions and experiences as well as describe behaviours (Fraenkel, & Wallen, 2009, p. 448). Many researchers in language education use questionnaires as a tool in their studies (e.g. Elbaum, Berg, & Dodd, 1993; Gu & Johnson, 1996; Horwitz, 1988; Oxford, 1990; Schmitt, 1997; Wu, 2008; Yang, 1999) to collect large amounts of data about teachers or students' opinions in second or foreign language learning.

Moreover, this tool gathers a large amount of information from a large number of populations in a short time. Besides, participants like to share their experience and opinions with others (Kvale, 1996).

3.3. The research population and sample

3.3.1. Participants

The sample of the study consisted of 91 third grade students distributed into four groups: two experimental groups and two control groups segregated by sex. Each female group contained 19 students whereas the male control group consisted of 27 students and the experimental group contained 26 students. The researcher used a purposive sample chosen from Salfit Elementary School for Boys and Salfit Elementary School for Girls in Salfit district where the experiment was conducted in the first semester of the school year 2017/2018. Figures 26-27 display the number and distribution of the students and their characteristics.

Also, a sample of 126 EFL teachers was used. It was chosen as a stratified random sample from the whole population according to levels of education system. The sample represented 60% of the whole population of English Language teachers since it was all English teachers who teach elementary classes in state-run and private schools. Figures 28-29 display the number and distribution of the teachers and their characteristics.
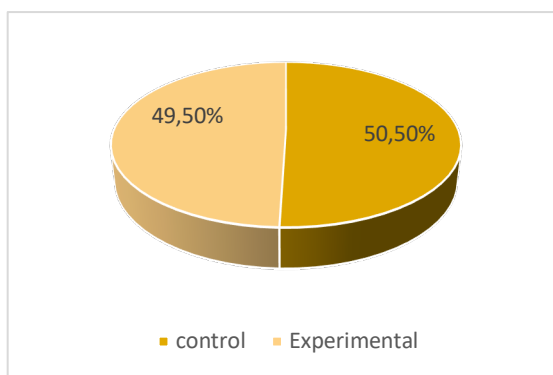
Figure 26. Distribution of Students' sample according to groups
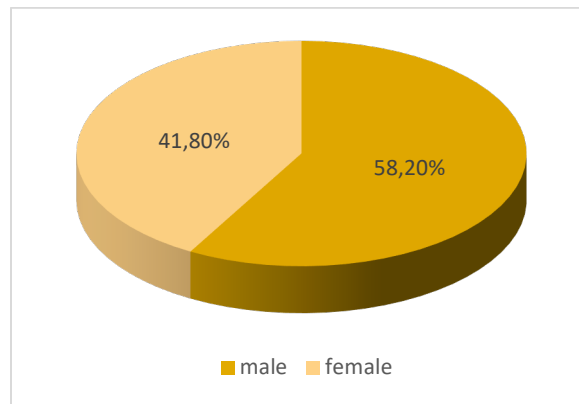
Figure 27. Distribution of Students' sample according to Gender
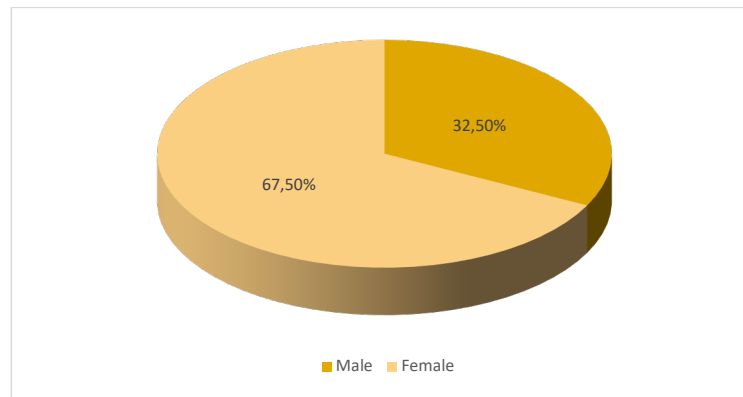
Figure 28. Distribution of the teachers' sample according to gender
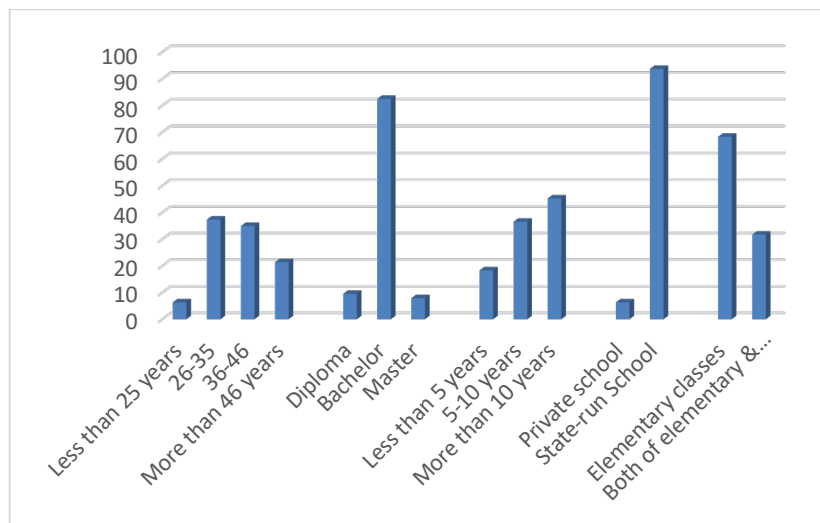
Figure 29. Distribution of Teachers' sample.

3.4. The variables of the study

The study included the following variables:

A. The independent variable represented in:

1. The teaching method

      1.1. Online Computer Games method

      1.2. The traditional method

2. Gender

      2.1. Male

      2.2. Female

3. The students' general ability of English language

      3.1. High achievers

      3.2. Low achievers

B. The dependent variable: represented in

  The students' achievement in English vocabulary

3.5. Instruments of the study

The researcher used a questionnaire and pre- and post-vocabulary tests to collect data. Both of the tools were prepared by the researcher and validated afterwards. These instruments are described in detail below.

1. The Questionnaire

In order to build deep understanding of teachers' beliefs and attitudes towards using online computer games in learning English vocabulary, the researcher used the questionnaire to collect the required information from a large population in a short amount of time (DeCuir-Gunby, 2008).

The questionnaire consisted of two parts. The first part contained personal data about English language teacher's gender, age, academic qualifications, experience in teaching English, school of teaching and which level they teach. The second part included 3 components and 33 closed items to measure the teacher's opinions on the incidental learning of English vocabulary through online computer games. The data of the responses to each

closed item were calculated according to the five-point-Likert scale (strongly agree = 5 points, agree = 4 points, Neutral = 3 points, disagree = 2 points, strongly disagree = 1 point). *A) Validity of the instrument:* It is important to know if the study tools measured what was intended. This can be tested in different ways, one of them is by looking at content validity which is "a measure of accuracy that involves formal review by individuals who are the expert in the subject matter" (Litwin, 1995, p. 82). This investigation was undertaken as a part of doctoral dissertation requirement. So, this study was conducted under the supervision of a committee that gave support through the entire research process and thus obtained the construct validity that Litwin (1995) recommended.

B) Reliability of the instrument: it refers to the "degree of stability exhibited when a measurement is repeated under identical conditions" (Litwin, 1995, p. 84). The Cronbach Alpha coefficient was used to find the reliability of the questionnaire. The reliability value of study was (0.827) which is high, and suitable for scientific purposes.

2. Vocabulary tests

The experimental method is the best way to collect information and find a correlation between one variable and another, and test the hypotheses of the research. Moreover, it reveals whether one element influences the others or not (Robson, 1993).

A pre-test was applied before the experiment and a post-test was applied after (Appendices A2, and A3). Each test contains 9 questions with four different categories (Match, fill in the blanks, circle and choose the correct answer).

A) The general aims of the test: the test, aimed to measure the influence of the online computer games strategy on English vocabulary was built according to the criteria of test specification.

B) The items of the test: the 37 items of the test focused on English vocabulary that 3rd grade students should know and/or is presented in the curriculum for this grade.

C) The validity of the test: the test was approved by professors from the University of Granada (Faculty of Education) for its suitability for the purpose of the study. Thus, minor modifications were made.

D) The reliability of the test: the Cronbach Alpha coefficient was used to find the reliability of the questionnaire. The reliability value of the study was 0.70 which is high, and suitable for scientific purposes.

*E) Items analysis***:** the researcher found the difficulty and discrimination indexes as follows:

Table 6
Difficulty and discrimination indexes of test items

Item	difficulty	discrimination
Q1A	0.714	0.367
Q1B	0.714	0.357
Q1C	0.692	0.243
Q1D	0.516	0368
Q2A	0.648	0.228
Q2B	0.319	0.234
Q2C	0.703	0.492
Q2D	0.868	0.448
Q2E	0.374	0.279
Q3A	0.538	0.296
Q3B	0.462	0.368
Q3C	0.637	0.444
Q3D	0.429	0.236
Q4A	0.538	0.402
Q4B	0.560	0.363
Q4C	0.484	0.433
Q4D	0.593	0.418
Q5A	0.824	0.264
Q5B	0.352	0.226
Q5C	0.516	0.232
Q5D	0.648	0.210
Q6A	0.385	0.209
Q6B	0.813	0.418
Q6C	0.429	0.367
Q6D	0.484	0.201
Q6E	0.253	0.359
Q7A	0.615	0.248
Q7B	0.626	0.299
Q7C	0.714	0.296
Q7D	0.823	0.327
Q7E	0.637	0.338
Q8A	0.330	0.297
Q8B	0.180	0.360
Q9A	0.857	0.330
Q9B	0.813	0.435
Q9C	0.823	0.266
Q9D	0.681	0.386

3.6. Procedure

This study was undertaken over four stages. The first step was to distribute the questionnaire among EFL teachers followed by the second step which was a pre-test. In the third step, the experiment was conducted, and in the fourth, a post test. To give a clear understanding, the four steps of the activities are explained below.

Questionnaire for teachers (September, 2017)

Pre-test for students (September, 2017)

The Experiment: 3 month duration (Learning by online games)

Post- test for all the participants student (December, 2017)
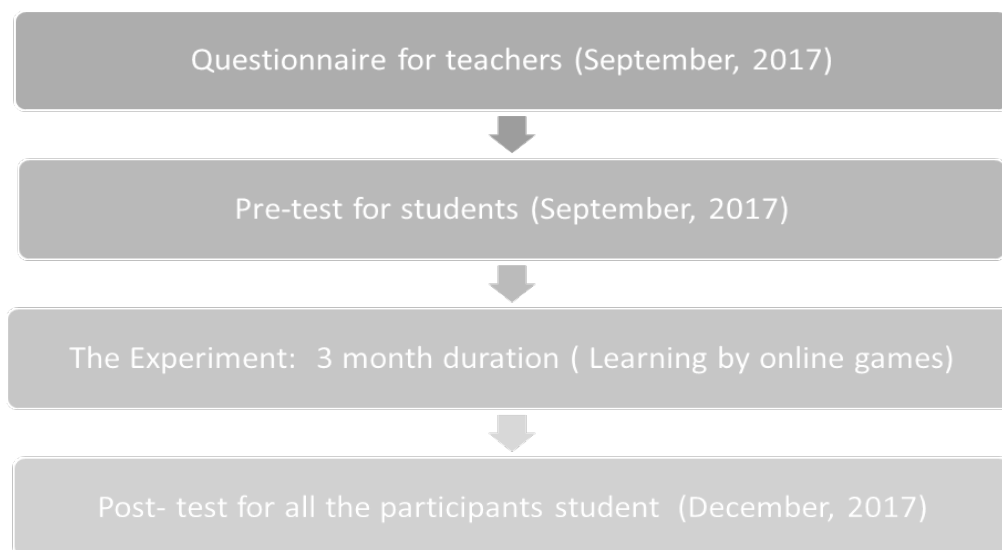
Figure 30. Data collection procedures

1. Questionnaire for teachers: the questionnaire was distributed in the school year 2017/2018. All English language teachers who teach elementary classes were asked to answer the questionnaire. The purposes of the study were explained to the respondents.

To analyze the teachers' responses toward using online computer games in teaching English vocabulary, the researcher used a scale that uses percentages as follows:

*80-100 % is a very high degree.

*70-79.9 % is a high degree.

*60-69.9 % is a moderate degree.

*Less than 60% is a very low degree.

2. Pre- test: the pre-assessment test was given to both the experimental and control groups to determine what knowledge they have of the vocabulary. It consisted of 9 questions with four different categories (Match, fill in the blank, circle and choose the correct answer)

3. The experiment: before conducting the experiment, the researcher identified the vocabulary that Palestinian students in the 3rd grade should learn depending on the previous and current materials. Then, collected the online-related games and divided them into items. In addition, the games were collected on a purpose-built website to make it easier for students to access them.

The experiment was conducted over 3 months and during this time, the control groups studied English vocabulary in the traditional way. This means that students studied by memorizing and repeating the words and their translation into Arabic translation. Whereas the experimental groups studied the same vocabulary through the chosen online computer games.

4. Post-test: after the experiment, a post-test was given to all groups to measure students' achievement and to compare the results between pre- and post-tests that would be processed into data. The researcher used the same vocabulary in both exams but in different types of questions to ensure the students had learned the desired vocabulary.

3.7. The online computer games project

1. Introduction: the study focuses on using online computer games in teaching vocabulary to 3rd grade students and their effect on learning English vocabulary. A website for use in the class was designed and managed entirely by the researcher. The design tool took place prior to the implementation phase, before doing the experiment, as explained below in more detail.

2. The construction of the online computer games project: in order to do the experiment on "using online computer games" the researcher used 50-60 games which were categorized into 9 different types since games often have the same design and format but with alternative lexical sets.

For the experiment to succeed, computer games were chosen carefully by specific criteria. Firstly, the games should be related to program topics (e.g. fruit). Secondly, they activate students' learning (Lam, 2013), and this can happen when online games have the following characteristics: concentration, goal clarity, feedback, challenge, autonomy, immersion, social interaction, and knowledge improvement (Fu, Su and Yu, 2008). Thirdly, like the language learning tasks, games should contain presentation, practice and production (Nunan, 1999). Furthermore, good video games give players the chance to test and move things from one place to another by using the mouse (Chang, Hsu, and Chao, 2008). Games should also be appropriate for different learners' styles and for individual and social learners (Birch and Sankey, 2008). Finally, it is claimed that the usefulness of online games is influenced by the quality of the games and the website security and design; students' attitude towards playing them; students' willingness to play; and the perceived ease of using the online games on its website (Holsapple, & Wu, 2008).

Games were chosen with the first three levels of the *English for Palestine* curriculum in mind. However, the researcher focused on the vocabulary that could be found in *English for Palestine-3*.

Also, the researcher categorized the games according to the vocabulary that students should learn into ten topics (animals, clothes, fruits, vegetables, food, transportation, jobs, body parts, colors and numbers). To make this easier for students, a website was designed specially to store the games which students could play individually, in pairs and in groups.

3. The online computer games implementation project: in this study, the researcher applied the program to both male and female students. At the beginning of the experiment, the researcher talked to students about the experiments and explained how to play the games and where to find them. Students played the games in the school computer lab and they showed a great deal of enthusiasm. The students were organized by the researcher, who also took on the role of class teacher, for the duration of the study so the students were organized in a way in which facilitated their cooperation. During the individual work each student had their own computer whereas, during the group and pair work, the teacher grouped the students to achieve the activity aims.

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The teacher opened the website (TEOCG) on the schools' computers and the website was saved on the Google Chrome Browser start page to make it easier for students to access it and save class time. Then instructions were given to students on how to start, what they should do and how to play. Students were then allowed to work independently. The teacher, in the first two weeks, decided which games students should play and in which order since information is given in different ways. Then students' performance was observed by the teacher who monitored the students and responded to queries. After playing alone, the teacher divided them into groups to play group games.

All games gave immediate feedback on their correct or incorrect answers and number of points achieved. Similarly, in group games the winner was revealed after completing each. Vocabulary Games fell into five categories:

1) Puzzle games

A) Word Search Game: it contains letters in a box and on the right of the box there are pictures. Students should join the letters to make the required words. This game helps students to learn the words meaning, spelling, pronunciation, and to memorize them.

B) The Goldilocks Porridge puzzle: in this game a player throws porridge by using the mouse in order to hit the bears. Each time a bear is hit, a letter from the story will appear to form a word.
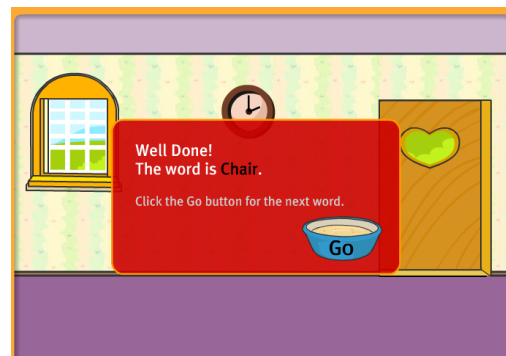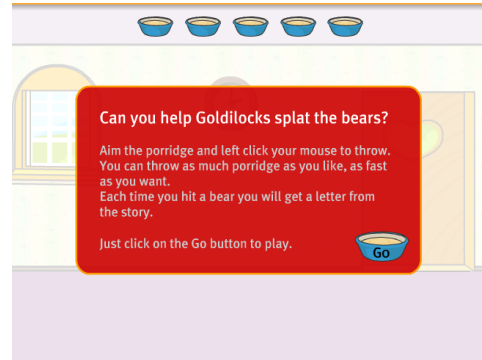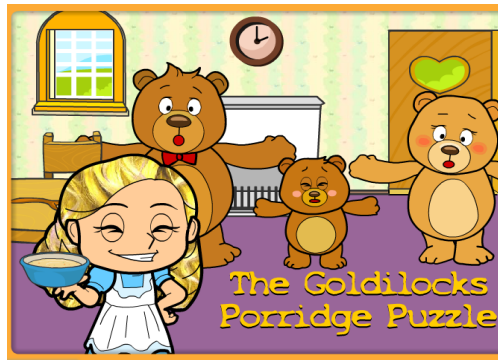
2) Memory Game: in this game, students find pictures and hidden words which learners should match. This memory game has audio, images and text which makes it possible to practice spelling, pronunciation, reading, and listening and word recognition.
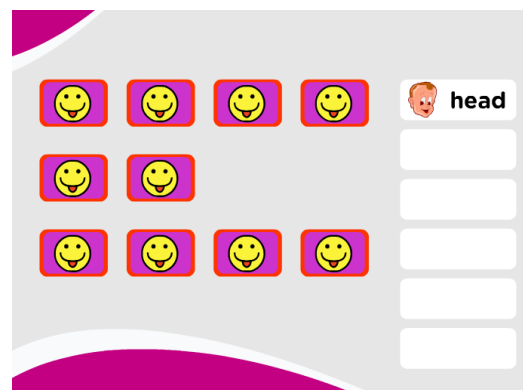
3) Interactive games

> A) Crocodile Board Game: in this game, students throw the dice and the number that appears means the steps that the frog should jump. In each place there is a question and if the person answers the question correctly, the frog moves

forward but if the answer is incorrect, the frog goes back. Students in this game face different challenges: the crocodile attacks them and they go back to the beginning. Also, it has audio, pictures and text. Students should choose the correct answer out of 4 choices.

B) Interactive Pirate Board Game: this game is similar to the crocodile board game but instead of the crocodile, this game has images of ships and pirates.

4) Competition games

A) Spin off Game: in this game, there is a wheel that spins and a variety of topic for example (clothes, animals and food. Where the wheel stops, the questions are asked about vocabulary related to this topic. Moreover, this game can be played in pairs or in groups.

B) Sea Battle Volley Game: this is a competitive game where two or more teams compete in a vocabulary test. The aim of this game is to practice using the vocabulary and know its meaning. This game has sound, spelling and text.

C) Catapult Game: this is a competition game where students are divided into two teams to compete with each other. Each team has a castle and the wrong answer means an attack on the castle and the questions continue until one of the team's castle collapses due to an accumulation of incorrect answers.
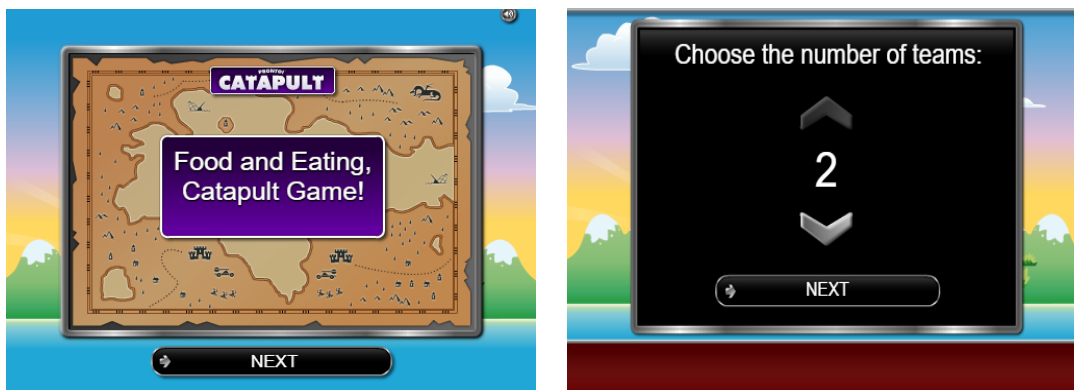
D) Moonshot Game: in this game more than two teams can play at the same time to compete with each other. Every team has a spaceship and there is a war between them. The team who answers correctly will win whereas the other ships will be destroyed by the winner. This game uses pictures, audio and physical movement. In addition, students choose the correct answer for the pictures, or they listen to a word and they should choose the correct written form for the word from the different options.
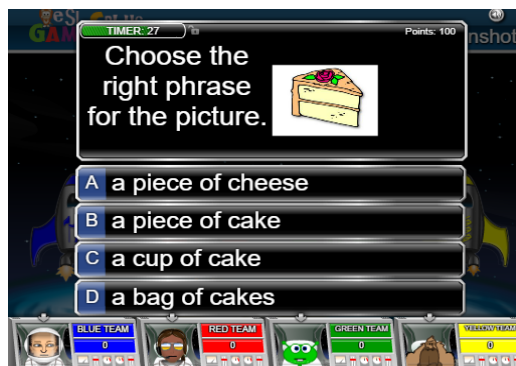
5) Concentration English Game: this is a concentration game where words and pictures move, and students should match the words with their appropriate pictures. When a student clicks on the card, they can hear the pronunciation of the words whether they see the written word or the picture.

3.8. The statistical analysis

In this study the researcher used the Statistical Package for Social Sciences (SPSS, v.17). Also, the researcher used Pearson correlation (KR20) and Split half coefficients of the test domains to show the test validity and reliability. The following statistics were used:

1. Means, frequencies, percentages, and standard deviations were used to analyze the questionnaire items.

2. T-Test, T-Test paired sample and One-Way ANOVA were used to measure the average statistical differences of the questionnaire independent variables and teachers' opinion. These measurements were also used to find the differences between the experimental and the control groups according to the teaching method and the students' level in English language whether they are high or low achievers.

3. Two Way ANCOVA was used to find the achievement level between the experimental and control groups according to gender.

CHAPTER IV

RESULTS OF THE STUDY

4. Results of the study

This chapter focuses on two things. Firstly, Palestinian teachers' opinions on using online computer games in learning English vocabulary which has been investigated using a questionnaire for teachers. Secondly, the effect of using online computer games in learning English vocabulary. This was analysed using an experimental study with pre-and post-tests.

To achieve the research purposes and to discover the results, the researcher used the Statistical Package for Social Sciences (SPSS, v.17). Moreover, to find the results for the research questions and hypotheses, the researcher analyses the data using T-Test and One-Way ANOVA in addition to using the mean, standard Deviation and ANCOVA.

4.1. Results of the first tool

The first research tool (i.e. the questionnaire) discussed four main topics: Palestinian teachers' opinion on learning vocabulary for students; teachers' use of online computer games; the advantages of online computer games from teachers' perspectives; and the relationship between teachers' opinion and the questionnaire's independent variables.

4.1.1. Palestinian teachers' opinion on vocabulary learning

Some of the questionnaire items ask teachers about their current beliefs in teaching English vocabulary as a foreign language for elementary students as Figure 31 shows.
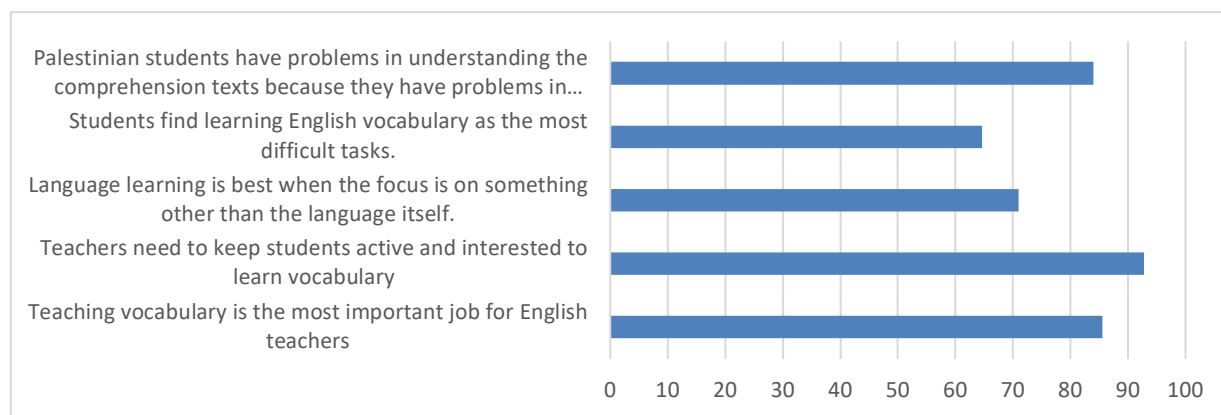
Figure 31. Teachers' perspective on vocabulary

A vast majority of Palestinian teachers concurred with the idea that teaching and learning vocabulary is not easy. Most of the teachers in the study agreed that "Teaching

vocabulary is the most important job for English teachers". However, 64.6% of the teachers also agreed that "Students find learning English vocabulary the most difficult task". A large percentage of them 84% were of the opinion that "Palestinian students have problems in understanding the comprehension texts because they have problems in vocabulary". So, the vast majority of teachers 92.8% said that "Teachers need to keep students active and interested to learn vocabulary". But nearly seven out of ten affirmed that "Language learning is best when the focus is on something other than the language itself".

4.1.2. Teachers' use of online computer games

Teachers have a positive opinion about using online games in teaching vocabulary and their answers come as the following:

Table 7
Using online computer games from teachers' perspective according to the questionnaire components

No.	Component	M	SD	Percentage
1	Teachers' perspectives toward using online computer games in teaching English vocabulary	3.71	0.37	74.2
2	Students' attitudes towards using online computer games in learning English vocabulary	3.87	0.39	77.4
3	The effect of online computer games on the learning of English vocabulary with respect to gender and age	3.50	0.52	70.0
	Total score	**3.72**	**0.33**	**74.4**

The questionnaire items were divided into three components as Table 7 shows. In each one there are different items related to the topic so the percentage for each component and its items are compared to see teachers' opinion. It is clearly shown in table 7 that the teachers' answers indicated a highly positive response for the items, and the highest response is for component two "Students attitude toward using online computer games in learning English vocabulary" with 77.4% and M= 3.87. The second most positive response is to the first item "Teachers' perspectives toward using online computer games in teaching English vocabulary" with 74.2% and M=3.71 as this section has two negative statements which teachers disagreed with. On the contrary, section three contains different statements related to students' gender which 70% of teachers agreed with "The effect of online computer games on the learning of English vocabulary with respect to gender".

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After analysing the questionnaire items that asked about teachers' opinion on using online computer games in their classes, the researcher finds the following results:

Table 8

Teachers' opinion of the use of online computer games in teaching English vocabulary

Use online computer games in teaching English vocabulary	Response					Mean	SD
	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**		
I prefer revising vocabulary using online games rather than worksheets.	19%	38.9%	30.2%	10.3%	1.6%	3.63	.96
I believe that English teachers should use new ways in teaching vocabulary like online computer games	37.3%	51.6%	7.1%	3.2%	0.8%	4.21	0.78

Table 8 gives some indicators of teachers' use of online computer games in their classes. More than five out of ten teachers 57.9% prefer to use this as a tool to revise vocabulary while 30.2% did not agree nor disagree. This item got a score of M=3.63 and SD=0.96. Moreover, a large number of teachers (88.9%) believed that online computer games should be used as a new way to teach vocabulary, and with M=4.21 and SD=0.78.

Even if teachers do believe in the importance of using online games in the classroom, this does not mean that they actually use them.
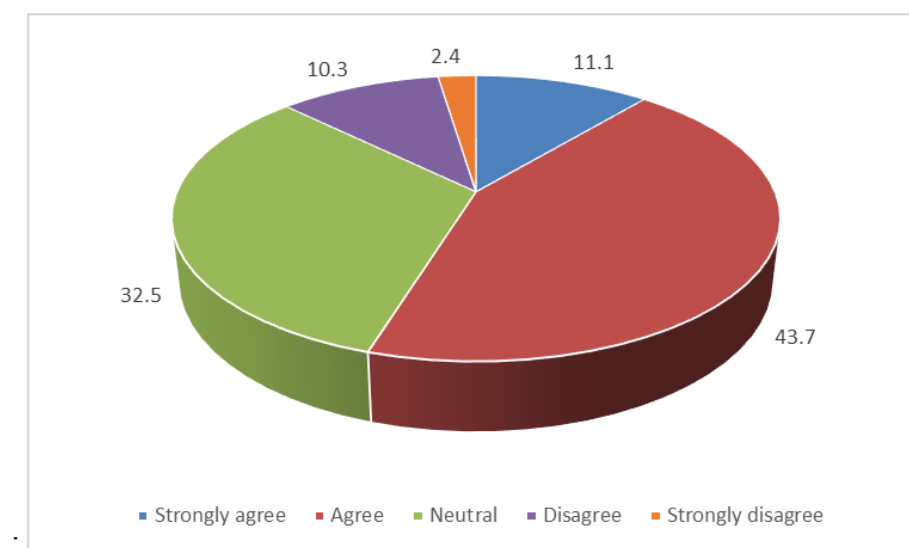
Figure 32. Teachers' using of online computer games.

This figure gives indications about Palestinian English teachers' use of online computer games in their teaching with over five out of ten teachers (54.8%) agreeing that they use them. However, a large number of teachers, 32.5%, did not agree nor disagree about using online computer games in their teaching. Only a few teachers (12.7%) disagreed with the use online computer games in teaching English.

However, we can see from the previous results in Figure 32 that a limited number of teachers use online computer games. This may be influenced by the availability of computers and Internet facilities as presented in Figure 33.
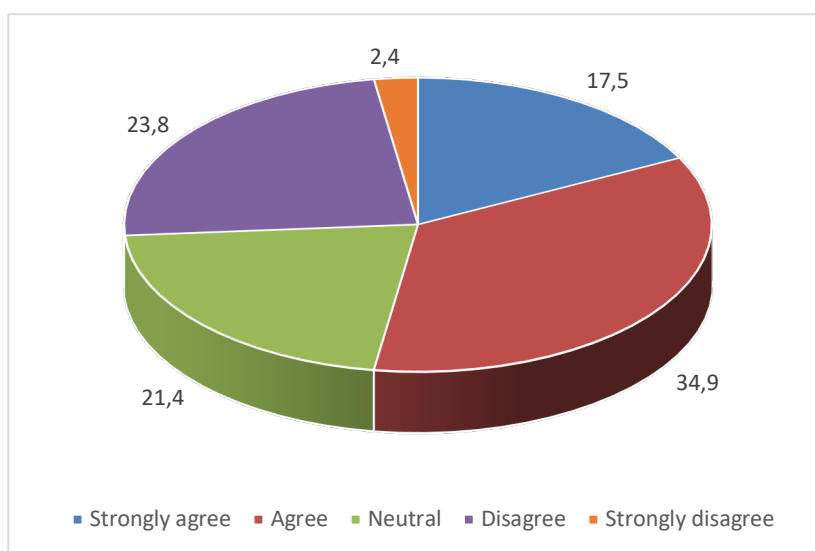
Figure 33. Internet services and facilities are limited

Clearly, slightly more than half of the teachers (66 out of 126) claimed that computer labs and Internet connections are limited in their schools. The largest number of teachers (34.9%) agreed that labs and facilities are limited in schools; while, the second largest number 23.8% disagreed. However, 21.4% were neutral, i.e., they neither agreed nor disagreed.

4.1.3. The advantages of online games in education according to teachers' opinion

There are many reasons to support the importance of online computer games in learning. Table 9 below shows the most outstanding:

Table 9
Teachers' rating on the reasons for using online computer games in terms of importance for learning

Reasons	Mean	Percentages
Stimulate students' interest	4.10	82%
Attract students' attention	4.07	81.4%
Motivate students to learn	3.97	79.4%
Foster self-learning	3.86	77.2%
Enable students to view and edit their answers easily	3.69	73.8%
Encourage cooperation and group work	3.69	73.8%

Six reasons are shown above for using of online computer games in education. The highest percentages are for stimulating students' interest, attracting students' attention, motivating students, and fostering autonomous learning. Encouraging group work and giving students the chance to view and edit their answers were rated as the least important regarding this topic.

4.1.4. Teachers' opinion on the advantages of online games in learning vocabulary

Online computer games have many advantages in learning vocabulary as teachers showed when answering the questionnaire in the following table:

Table 10
Teachers' opinion of the benefits of online computer games in learning English vocabulary

The advantages of online computer games in learning English vocabulary	Response					Mean	SD
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
Help students to remember new words easily.	25.4%	65.1%	4.8%	2.4%	2.4%	4.09	0.78
Encourage students to recall vocabulary.	17.5%	69%	11.1%	2.4%	0%	4.02	0.62
Improve students' ability to learn English vocabulary effectively.	22.2%	63.5%%	12.7%	1.6%	0%	4.06	0.64
Increase students' productivity in vocabulary.	22.2%	62.7%	13.5%	1.6%	0%	4.06	0.65
Increase students' ability to use and learn vocabulary.	22.2%	61.9%	13.5%	1.6%	0.8%	4.06	0.64

Connect students with learning vocabulary at home.	18.3%	59.5%	17.5%	4.8%	0%	3.91	0.74
Playing online computer games a lot helps students improve their English.	22.2%	50.8%	17.5%	7.9%	1.6%	3.84	0.92
Students prefer to learn English vocabulary by using online computer games.	15.9%	55.6%	23.8%	3.2%	1.6%	3.81	0.80

The advantages of online computer games in learning vocabulary are listed above from the highest to the lowest percentage of responses. The most important benefit that teachers indicated was that using online games fosters students' learning of vocabulary as the games help them to remember new words (90.5%); encourage students to recall vocabulary (86.5%); and improve students' ability to learn English vocabulary effectively (85.7%). They also increase students' productivity (84.9%); improve students' ability to learn and use vocabulary (84.1%); and lead to better English (73%). But the lowest percentage in this list is that 71.5% of teachers agreed that students like to learn vocabulary with online computer games, and 77.8% agreed that they connect students with learning vocabulary at home. Interestingly, 23.8% of teachers did not agree nor disagree that students prefer to learn vocabulary with online computer games and 17.5% did not agree nor disagree that online games connect students with learning English vocabulary at home.

However, when teachers were asked about the relationship between the amount of game play and vocabulary learning, 73% of teachers agreed that "the more students use online computer games, the better their English language will be" as the following figure shows:
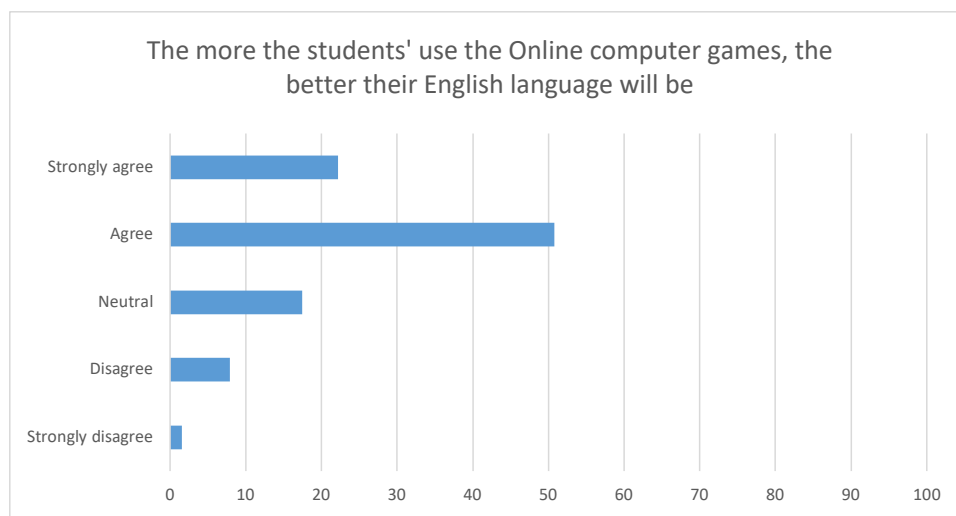
Figure 34. The relationship between the amount of online game play and learning English.

Online computer games help to solve some problems that students face in learning vocabulary. Table 11 outlines three main problems in learning: slow learning, weakness in learning, and shyness which teachers can overcome by using online computer games.

Table 11
Learning problems that online computer games can help solve

Learning problems	Response					Mean	SD
	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**		
Help shy students to participate.	29.4%	57.9%	9.5%	3.2%	0%	4.13	0.71
Help slow learners to learn better.	17.5%	61.1%	16.7%	4.0%	0.8%	3.90	0.75
Solve students' weaknesses in vocabulary.	7.9%	59.5%%	25.4%	7.1%	0%	3.68	0.72

The table above shows that online computer games help students who have several difficulties in learning vocabulary to learn better, such as slow and shy learners. Notably, 25.4% of teachers neither agreed nor disagreed that online computer games can address students' weaknesses and 67.6% think that this way will indeed improve students who have some weakness in learning vocabulary. However, a large number of teachers (82.6%) think that online computer games are more appropriate for shy students as they help them to participate and learn. Also, 78% agreed that slow learners learn better with this tool.

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However, a high percentage of teachers did not agree nor disagree when presented with the negative statements in the questionnaire:

Online computer games have a negative effect on students' proper learning of vocabulary.
- Strongly disagree: 6,7
- Disagree: 39,7
- Neutral: 34,1
- Strongly agree: 7,2
- Agree: 12,7

I believe that online computer games not the appropriate technique in teaching vocabulary.
- Strongly disagree: 5,6
- Disagree: 47,6
- Neutral: 29
- Strongly agree: 4
- Agree: 13,5

I believe that Students will not learn more vocabulary if they play online games.
- Strongly disagree: 4
- Disagree: 59,5
- Neutral: 16,7
- Strongly agree: 7,1
- Agree: 12,7

Figure 35. Responses to negative questionnaire items

The previous figure has three negative statements in order to help find the true opinions of the teachers. The first "online computer games have a negative effect on students' proper learning of vocabulary" has a high level of neutral opinion (34.1%). The second is "I believe that online computer games are not the appropriate techniques in teaching vocabulary" with 29% of teachers neither agreeing nor disagreeing. Moreover, 16.7% of teachers gave neutral answers for the item "I believe that students will not learn more vocabulary if they play online games". This may indicate that teachers have limited information about this tool and how they affect students' learning.

4.1.5. The independent variables and teachers' opinion

There are six independent variables in the questionnaire that the researcher focused on to investigate if they affected teachers' opinion on using online games in teaching English vocabulary. In order to find their effects, the researcher used six main null hypotheses:

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- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to Gender.
- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to Age.
- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to Academic qualification.
- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to Professional experience.
- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to the School of teaching.
- There are no significant differences at α=0.05 in the influence of using online computer games on learning English vocabulary for elementary students in Palestine due to levels of education system.

The results are illustrated in the following figure:

	Gender	Age	Academic qualification	Professional experience in teaching English	School of teaching	Levels of education system
sig	0,742	0,938	0,917	0,655	0,224	0,66
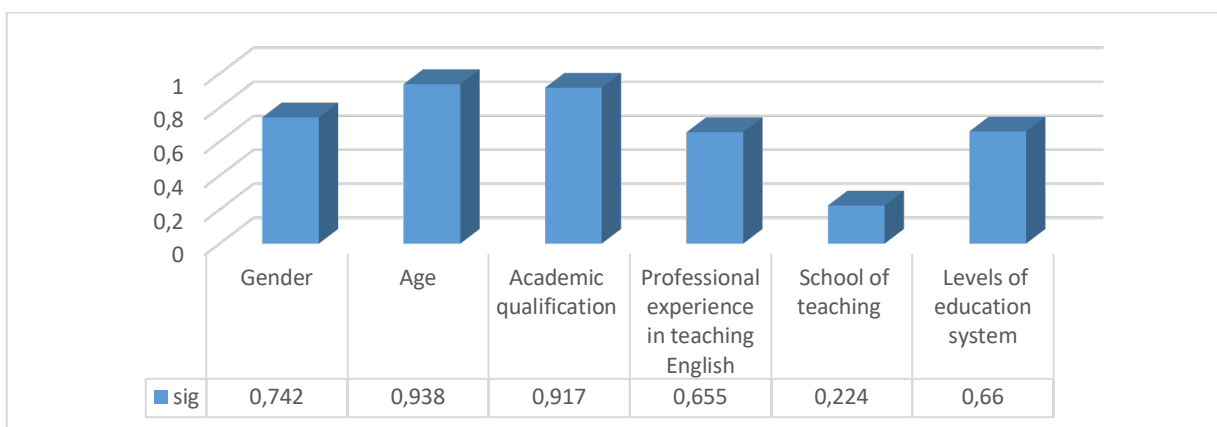
Figure 36. The independent variables and teachers' perspectives in using online games.

The above figure compares teachers' opinions about using online games with their independent variables: gender (male or female); age (less than 25 years old, 26-35 years old, 36-46 years old and over 47 years old); academic qualification (diploma, bachelor, master and others); Professional experience in teaching English as a foreign language (less than 5 years, 5-10 years and more than 10 years); school of teaching (private School and state-run School); and year groups being taught (elementary classes, secondary classes or both of them).

This is explained in detail in Table 12 below which depicts teachers' gender and their attitude toward using online computer games in learning vocabulary.

Table 12

The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' gender

Gender	Frequency	Mean	S.D	T-value	Sig.*
Male	41	3.71	3.71	0.330	0.742
Female	85	3.73	3.73		

* Significant at α= 0.05, D.F = 124.

The T-Test for independent samples showed that teachers' gender does not affect teachers' opinion since the total score of the sig=0.742 (p>0.05). And male and female teachers have almost the same mean. Males M=3.71 and females M=3.73.

Teachers' opinion was also compared according to their age as shown in Table 13.

Table 13

The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' age

Source of variation	Sum of Squares	D.F	Mean Squares	F	Sig.*
Between groups	0.045	3	0.015	0.137	0.938
Within groups	13.464	122	0.110		
Total	13.509	125			

*Significant at α= 0.05

One Way ANOVA was used to test the differences of teachers' ages on their perspectives. The results showed that this variable has no effect on teachers' opinions as the sig=0.938 (p>0.05).

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The academic qualification of the teachers and their effects on their opinion about online computer games in learning vocabulary was tested with One Way ANOVA as presented in Table 14.

Table 14.
The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' academic qualification

Source of variation	Sum of Squares	D.F	Mean Squares	F	Sig.*
Between groups	0.019	2	0.009		
Within groups	13.490	123	0.110	0.086	0.917
Total	13.509	125			

*Significant at α= 0.05

It can be seen from the data in Table 14 that teachers' perspectives on utilizing online computer games in learning vocabulary is not affected by the teachers' academic qualification since the sig=0.917 (p>0.05).

Furthermore, the professional experience of teachers was compared using One Way ANOVA to show if this variable influences the teachers' opinion.

Table 15
The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' professional experience

Source of variation	Sum of Squares	D.F	Mean Squares	F	Sig.*
Between groups	0.093	2	0.046		
Within groups	13.417	123	0.109	0.425	0.655
Total	13.509	125			

*Significant at α= 0.05

This indicates that the professional experience of teachers got sig=0.655 (p>0.05) which means it does not have any impact on teachers' attitudes toward using online computer games.

Besides, the schools that teachers work in were also studied to see if this variable affects teachers' beliefs by using T-Test for independent samples.

Table 16

The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' school of teaching

School of teaching	Frequency	Mean	S.D	T-value	Sig.*
Private school	8	3.58	0.50	1.222	0.224
State-run School	118	3.71	0.31		

* Significant at α= 0.05, D.F = 124.

The elementary school teachers who work in private and state-run schools were compared. The results showed that teachers' opinions were similar whether they taught in private schools or state-run schools. It is clear from table 16 which indicated that the significant difference for both schools is sig=0.224 (p>0.05). Moreover, the means also proved that the results for teachers' opinions in both schools are similar. The mean for private schools' teachers is 3.58, and for state-run schools' teachers M=3.71.

Also, some of the teachers are teaching elementary classes only or are teaching elementary and secondary classes. So, their opinions were also compared using T-Test for independent samples to see if this affects their perspectives or not as indicated in Table 17 below:

Table 17

The perceived influence of using online computer games on learning English vocabulary for elementary students in Palestine due to teachers' levels of education system

levels of education system	Frequency	Mean	S.D	T-value	Sig.*
Elementary classes	86	3.73	0.32	0.442	0.660
Both of elementary & secondary	40	3.70	0.34		

* Significant at α= 0.05, D.F = 124.

Both teachers have the same opinion toward using online computer games in learning English vocabulary with sig=0.660 (p>0.05). The means for both groups of teachers also corroborated a similar opinion. The mean for teachers who teach elementary classes is 3.73, and those who teach both elementary and secondary classes is 3.70.

As explained above, teachers' opinion is not influenced by teachers' variables but by teachers' real use of online games.

4.2. Results from the experimental tool

In this part, the researcher gathered information from the control and experimental groups by using pre-and post-tests. The most important thing to be discussed here is students' learning of vocabulary and this was analysed quantitatively to see which group learned vocabulary better. Also, part of this section will concentrate on the experimental group learning through online computer games and their reaction towards learning with this tool.

4.2.1. Control group vocabulary test results

As mentioned in chapter III, the control group consisted of two sub-groups: 27 male students and 19 female students. And to discover students' actual vocabulary knowledge before the experiment took place, a pre-test was administered to students. After the experiment, a post-test was given to students to check their new vocabulary knowledge as shown in figures 37 and 38 below:
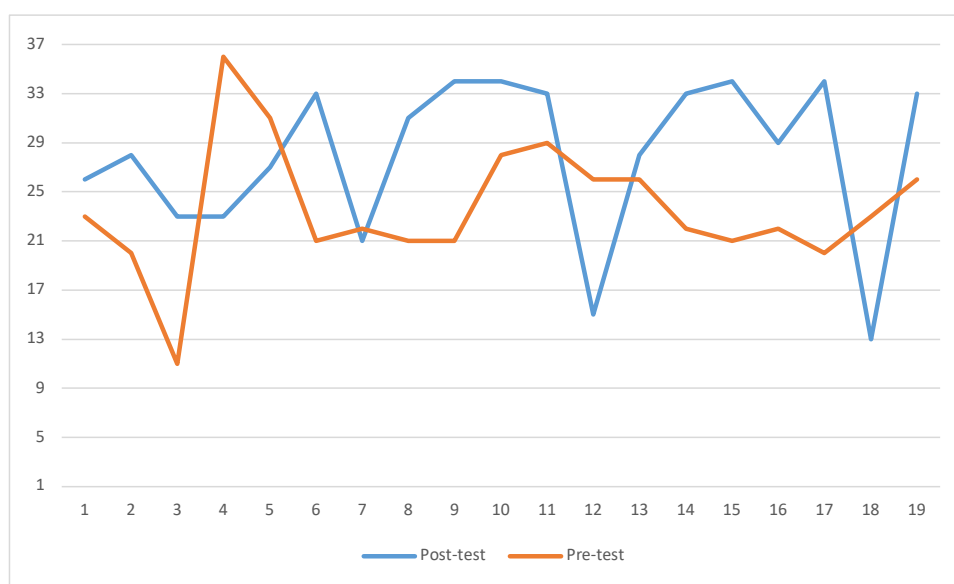
Figure 37. Female control group results in vocabulary test.

As portrayed above most students got better results except five female students (4, 5, 7, 12, 18) whose results in the pre-test were better than in the post-test. Overall, the results show that students' average knowledge of vocabulary had increased from 64% to 76% after the experiment.

However, the results of the male control group in Figure 38 indicates that males in the pre-test got better results than in the post-test.
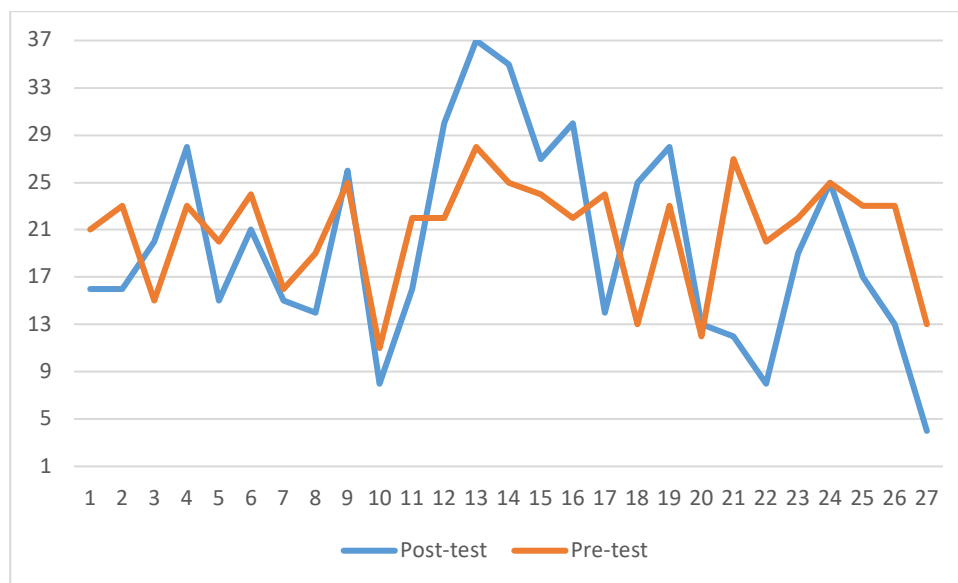
Figure 38. Male control group results in vocabulary test

The average score of male results in the pre-test is 20.92; whereas, the average in the post-test is 19.70. This shows a low average in both exams but what is more remarkable is that the average percentage of correct answers decreased from 56.5% in the pre-test to 53.25% in the post-test after the experiment.

4.2.2. Experimental group vocabulary test results

The experimental group overall consisted of a male experimental group of 26 students and female experimental group of 19 students. As for the control group, pre- and post-tests were conducted with female and male students to compare their results after the experiment had taken place as presented in Figures 39 and 40 below:
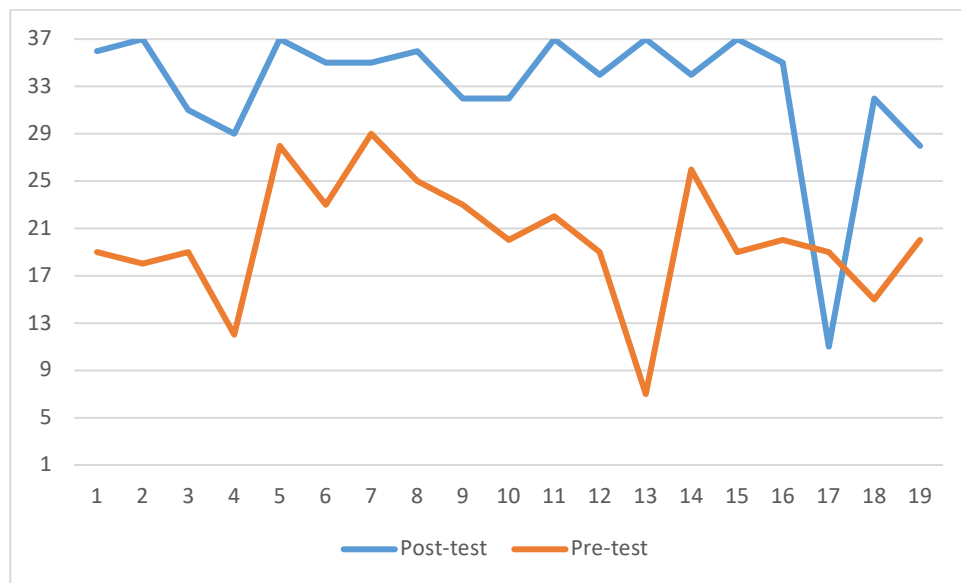
Figure 39. Female experimental group results in the vocabulary tests.

The previous figure clearly shows that most female students got better results in the post-test except one student who got a lower mark. However, the gap between the results in the pre-and post-tests is wider in the female experimental group than in the female control group since the average increased from 54.5% to 89% which is a very significant difference. with the average mark in the pre-test being 20.15 and the average mark in the post-test being 32.9 out of 37. The results for the male experimental group are similar to the female's results as indicated in Figure 40 below:
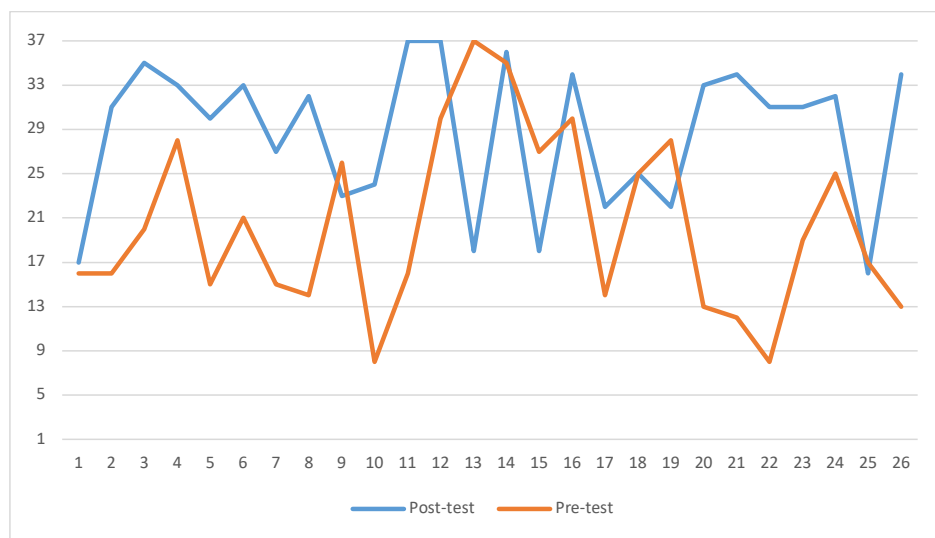
Figure 40. Male experimental group results in the vocabulary tests

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As indicated above 5, students did better in the pre-test than in the post-test. However, the average score rose from 55% to 77% which clearly showed a wide gap between the two results. In addition, the average score for the pre-test was 20.30, whereas, the average score for the post-test was 28.65 out of 37.

4.3. Learning with online computer games

To find which way is better for learning vocabulary, the following hypothesis was used:

There are no statistically significant differences at α ≤ 0.05 in the achievement level between the students who learn English language through online computer games (experimental group) and those who learn English language through the traditional method (control group).

The researcher used T-Test for independent samples to measure the significance of differences. After analysing the results of the pre- and post-tests, the findings showed that the results of the pre-test for the control and experimental groups were closer to each other. Whereas, the results of the post-test indicated differences between the control group who learnt via the traditional way and the experimental group who learnt with online computer games as examined below:
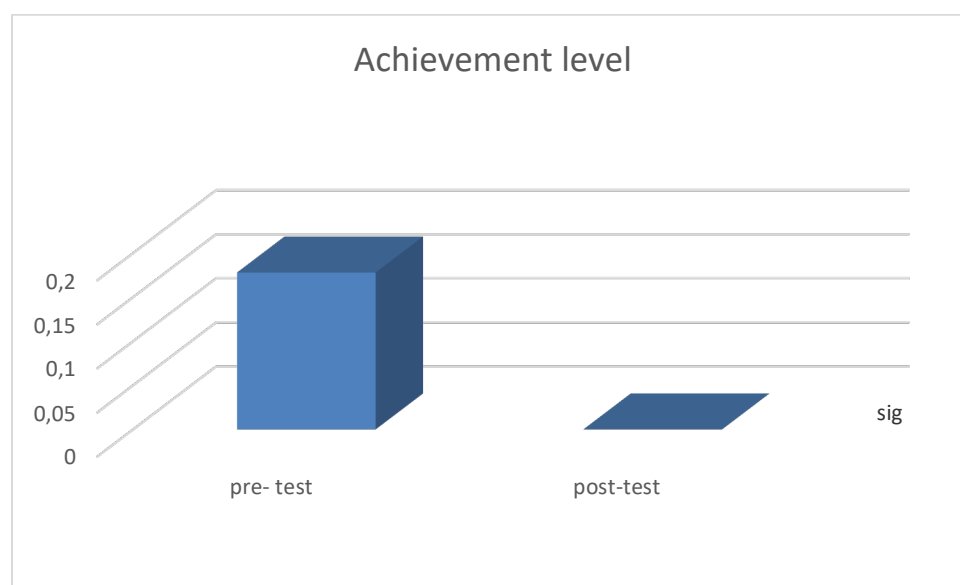
Figure 41. Achievement level between the students who learn English language with online computer games.

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From the graph above we can see that pre-test indicates no significant differences between the control and experimental groups with sig=0.178 (p>0.05). Whereas it was found that there are indeed noticeable differences in the post-test between the control and experimental groups with sig=0.0001 (p<0.05).

However, as there are differences between both groups in the post-test, it is important to know which group is better at learning English vocabulary (the control or the experimental groups). This can be clarified by the means for both groups in Table 18:

Table 18
The achievement level between the experimental and the control groups

Test	Group	Frequency	Mean	S.D	T-value
Post	Control	46	23.13	8.67	4.512
	experimental	45	30.44	6.64	

* Significant at $\alpha= 0.05$, D.F = 89.

T-Test for independent samples of the achievement level was used in Table 18. The results explained that the mean of the experimental group is 30.44 which is higher than the mean of the control group which is 23.13 in the post-test as depicted in Figure 42 below.
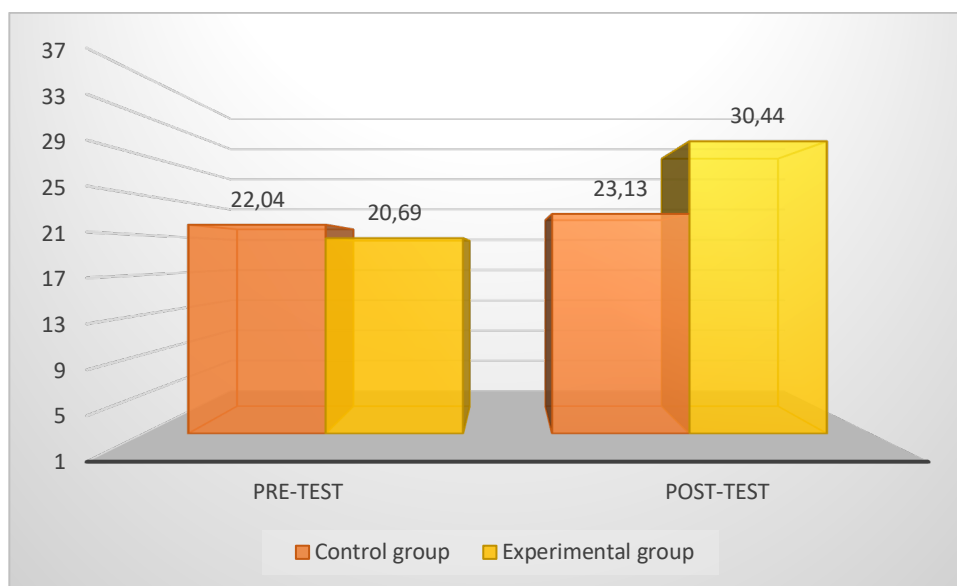
Figure 42. The achievement level between experimental groups and control groups.

The mean for each group evinces which one got better results in the pre- and post-tests. The control group in the pre-test had M=22.04; whereas, the experimental groups had a

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lower M= 20.69. Even if the pre-test results showed no differences between the two groups, the means clearly finds a slight difference.

On the other hand, the means of the post-test for the control groups is 23.13 and S.D=8.67; while in the experimental groups M=30.44 and S.D=6.64. This highlighted that students who learn with online computer games retain more English vocabulary than students who learn in the traditional way.

Similarly, these findings were supported by teachers' answers for some statements that investigated what made online computer games beneficial for learning English vocabulary. For example, "Online games stimulate students' interest in learning vocabulary" as Figure 43 presents.
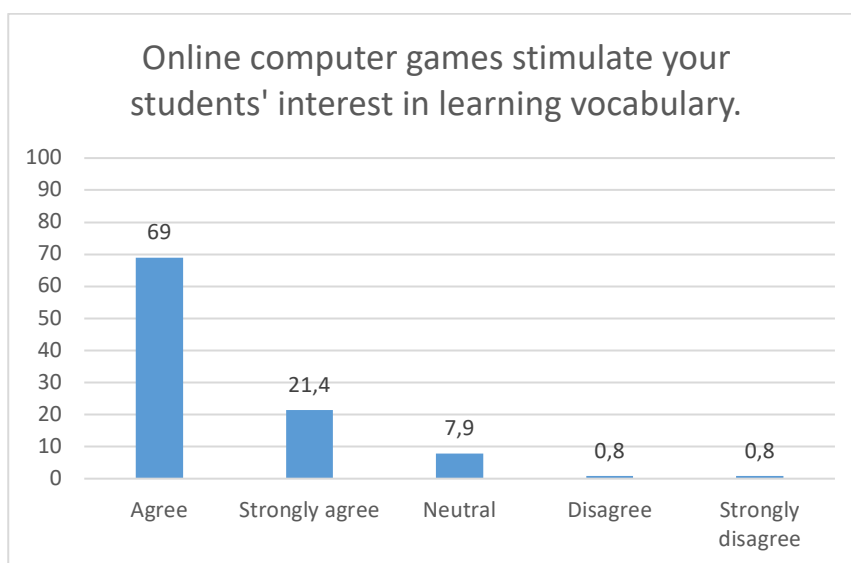
Figure 43. Computer games stimulate students to learn vocabulary.

These results show that most teachers (90.4 %) agreed that online computer games stimulate students to learn English vocabulary.

Moreover, a majority of teachers (86.5%) were of the opinion that "online computer games encourage students to recall vocabulary" as the following figure shows:
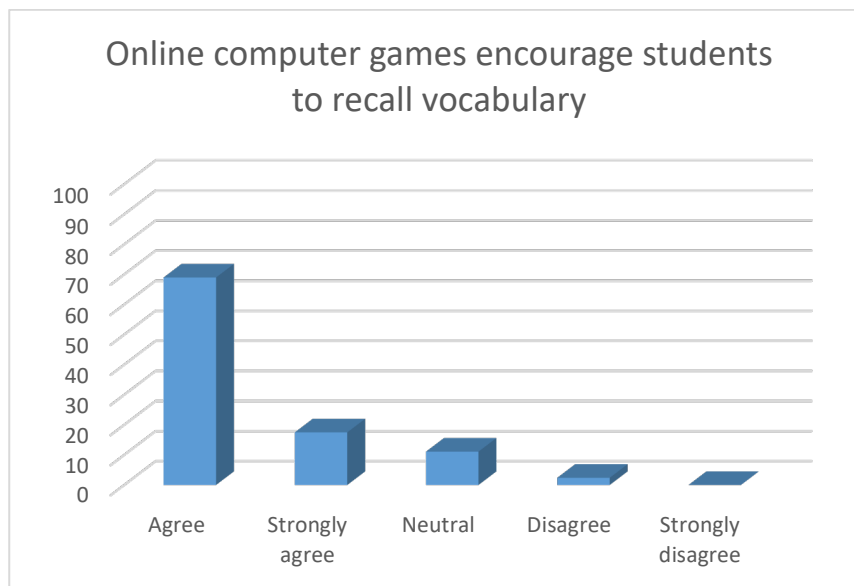
Figure 44. Online computer games encourage students to recall vocabulary

In addition, 85.7% of Palestinian teachers agreed that "online computer games improve students' ability to learn English vocabulary effectively" as clarified below:
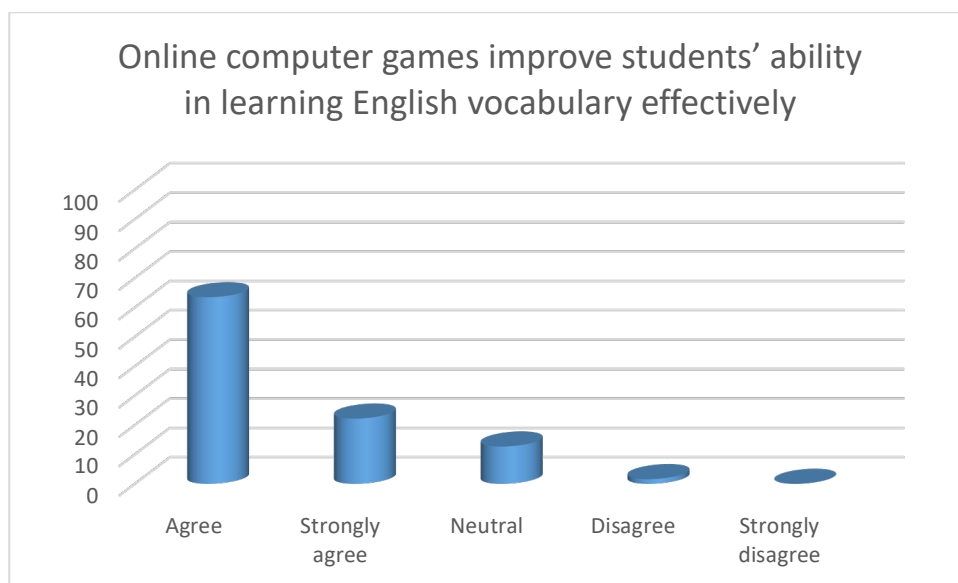
Figure 45. Online games develop students learning of vocabulary.

Only a small number of teachers disagreed (1.6%) while nobody strongly disagreed. This leads us to the statement "Online computer games increase students' productivity in vocabulary".
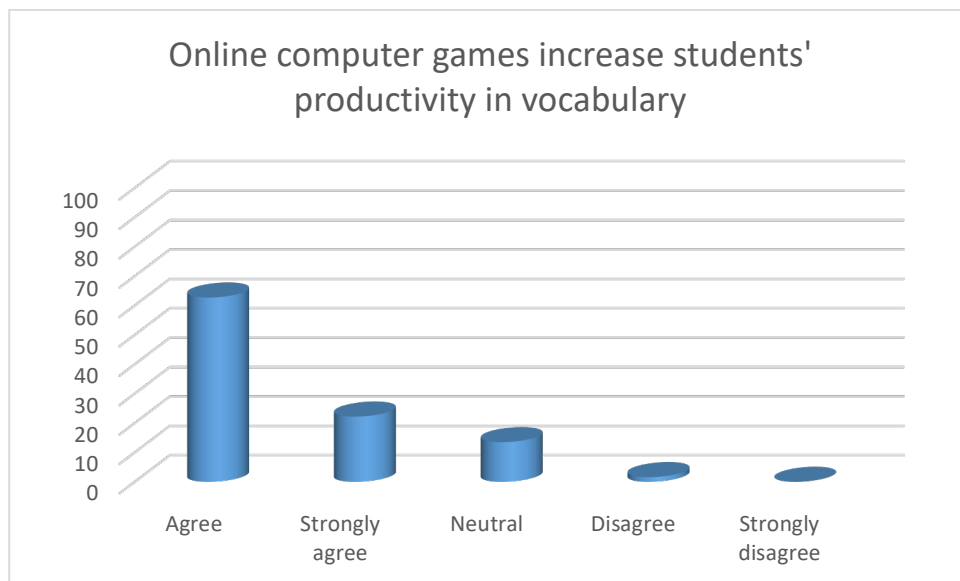
Figure 46. Students' vocabulary production can be increased with online computer games.

Moreover, online computer games "increase students' ability to use and learn vocabulary" as presented below:
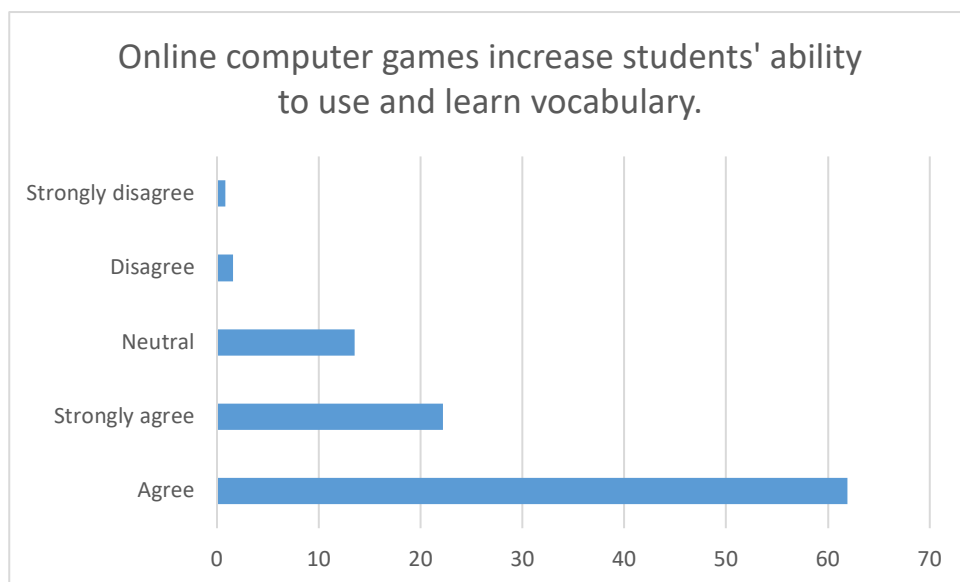
Figure 47. Students' knowledge in vocabulary can be increased with online computer games.

A vast majority of teachers 84.1% agreed that online games enrich students' vocabulary. The final group of figures indicated the advantages of online computer games

in learning English vocabulary which helped the experimental group achieve better results than the control groups.

4.4. High and low achievers

In this section, the students' level (low and high achievers) were investigated to determine whether online computer games affect the performance of either or both the low or high achievers.

For the purpose of analysis, the following hypothesis is used:

There are no statistically significant differences at α ≤ 0.05 in the achievement level between the high achievers and low achievers in the experimental group and their counterparts in the control group.

To answer this question and to find the students' level and which way of teaching increases the level of both types of achievers, the students' grades in the post-test were investigated. However, the low achievers' students got a mark of less than 50%; whereas, the high achievers' students got a mark higher than 50% in both tests. Also, comparisons between the two groups were made using T-Tests to analyze the significance of differences for the post-test as Figure 48 explains.
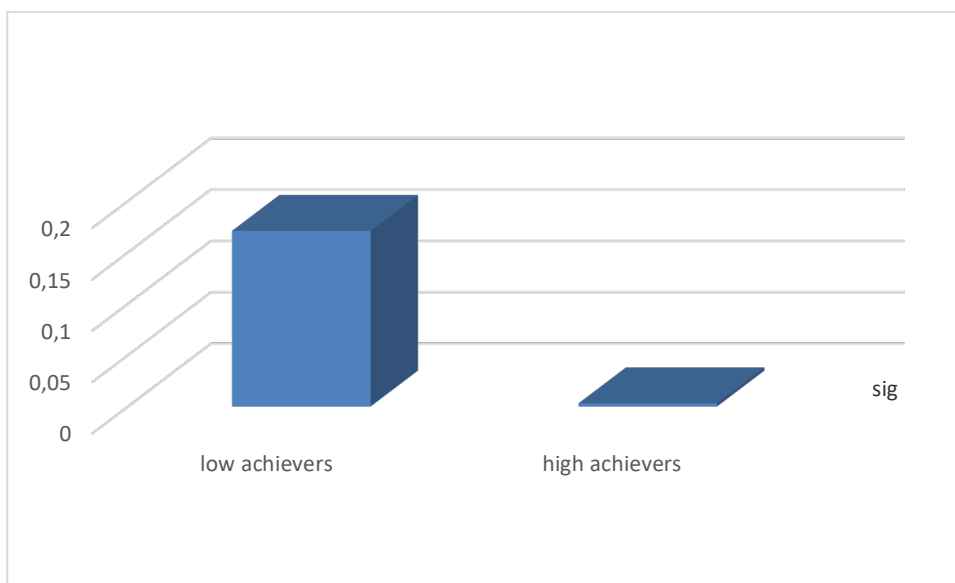
Figure 48. The significant differences for the high and low achievers' achievement in the experimental group and their counterparts in the control one.

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As it can be seen from the above figure, the low achievers in the control and experimental groups got a sig=0.171 (p>0.05); whereas the high achievers in the control and experimental groups got sig=0.003 (p< 0.05). These numbers indicate that there are indeed significant differences in the performance of high achievers. Besides, it is clearly shown that low achievers in both the experimental and control groups got similar results.

So, it is necessary to know which particular group of high achievers are affected more profoundly by the use of online computer games for learning English, those in the control or the experimental groups. This is explained in Table 19.

Table 19

The achievement level between the high achievers and low achievers in the experimental group and their counterparts in the control group

Students	Group	Frequency	Mean	S.D	T-value
Low achievers	Control	17	13.41	3.73	1.422
	Experimental	5	16.00	2.92	
High achievers	Control	29	28.83	4.68	3.134
	Experimental	40	32.25	4.33	

* Significant at α= 0.05

This table gives information about the low and high achievers in the control and experimental groups. Comparing the two results, it can be seen that the mean for the higher achievers is higher than for the low achievers in general. Nevertheless, the mean for both the high and low achievers in the experimental group was higher than in both control group as indicated in figure 49. On the other hand, the standard deviation for the high achievers in both groups is slightly different (S.D=4.68 for the control group and for the experimental group S.D=4.33). In addition, the T-value for low achievers in both groups is 1.42 and the T-value for high achievers is 3.13 which shows that the high achievers have performed better than low achievers.

It is shown from the data in Figure 49 that high achievers do better (the control or experimental groups).
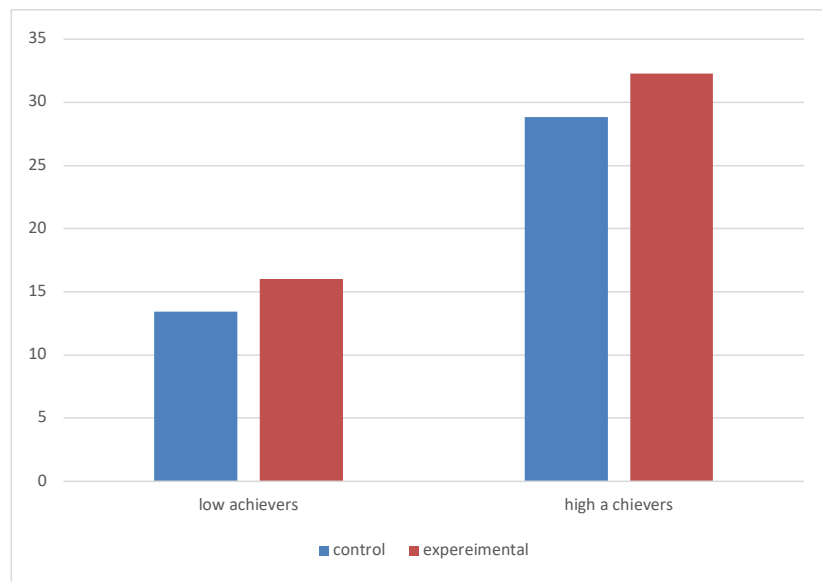
Figure 49. The achievement test for low achievers and high achievers in the control and experimental groups.

The above figure compares the high and low achievers in the experimental and control groups even though there are no significant differences between the low achievers in both groups. From the figure above, the low achievers in the control group had M=13.41; while in the experimental group they had M=16.00. Whereas, the high achievers in the control group got M=28.83, and their counterparts in the experimental group got M=32.25.

This points out that the high achievers in the experimental group did better than their counterparts in the control group and that the high achievers outperformed the low achievers in the experimental group.

Taking these results into consideration, some of the questionnaire items asked teachers about their opinion on items related to students' levels:

The first claims that "Slow learners can learn better by using online computers games" as represented in the figure below:
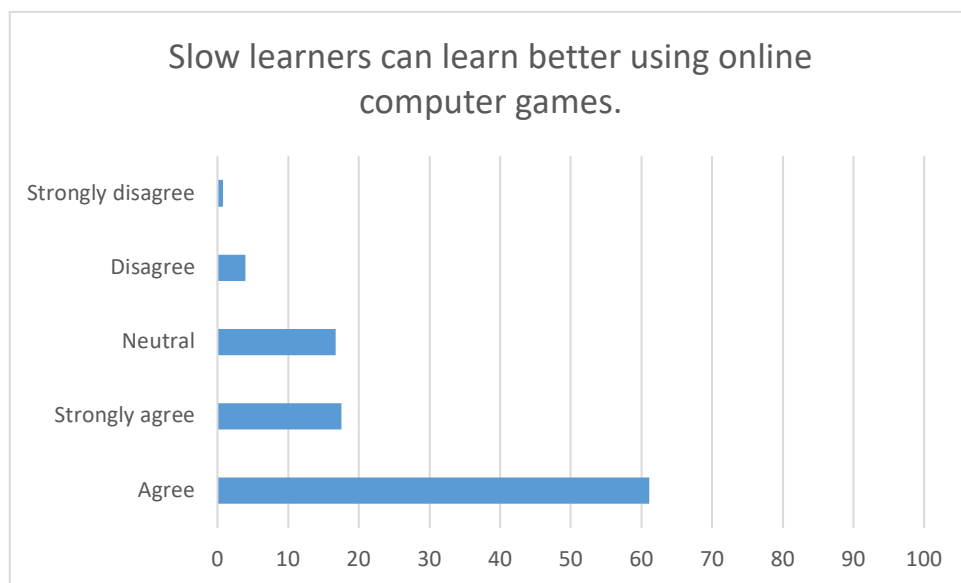
Figure 50. slow learners and learning with online computer games.

The result showed that 79.4% of respondents agreed that online computer games helped slow learners to learn English.

The second item stated that "Online computers games help shy students to participate" as displayed in Figure 51 below:
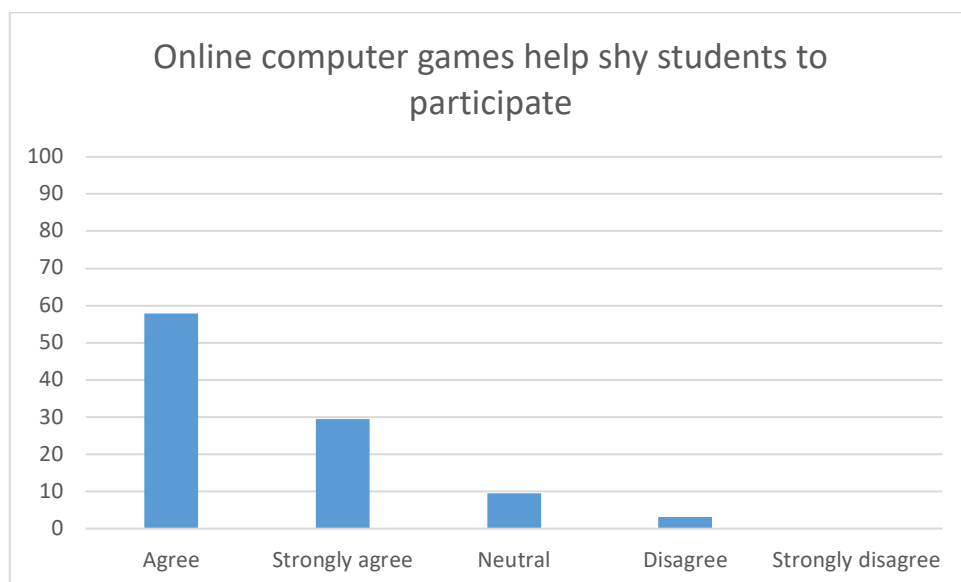
Figure 51. Online computer games affect shy students' participation.

A large percentage of the teachers (87.3%) agreed that online computer games make shy students participate more in the learning process. Whereas approximately 10% of respondents did not agree nor disagree.

4.5. Gender and learning English vocabulary

In order to compare gender within each group and their ability to learn vocabulary, the researcher used male and female experimental groups and male and female control group as explained in chapter III. Also, to discover if learning vocabulary is affected by gender, the following null hypothesis was used:

There are no statistically significant differences at α ≤ 0.05 in the achievement level between the experimental group and the control group due to gender.

Firstly, it was necessary to compare the results of the pre- and post-tests for males and females in general by using T-Test for independent samples as shown in Figure 52.

Figure 52. The significant differences for the pre- and post- test due to gender.

The results of the correlation analysis are summarized in Figure 52. This shows that there are indeed significant differences between male and female students in the post-test. What is significant is that the pre-test got sig=0.381 (p>0.05) and the post-test sig=0.0001 (p<0.05).

Moreover, table 20 compared gender performance in learning English vocabulary in the post-test.

Table 20
The achievement level between male and female

Test	Gender	Frequency	Mean	S.D	T-value
Post	Male	53	24.09	8.79	3.753
	Female	38	30.45	6.62	

* Significant at α= 0.05, D.F = 89.

To distinguish between these two genders, a T-Test was used. As shown in Table 20, for male students M=24.03; whereas for female students M=30.45. This indicates that female students outperformed male students in learning English vocabulary.

But which female group got higher grades, the experimental or the control groups? Frequencies and means of achievement level for groups and gender were used. Figure 59 expresses the females' average score in both groups (control and experimental).
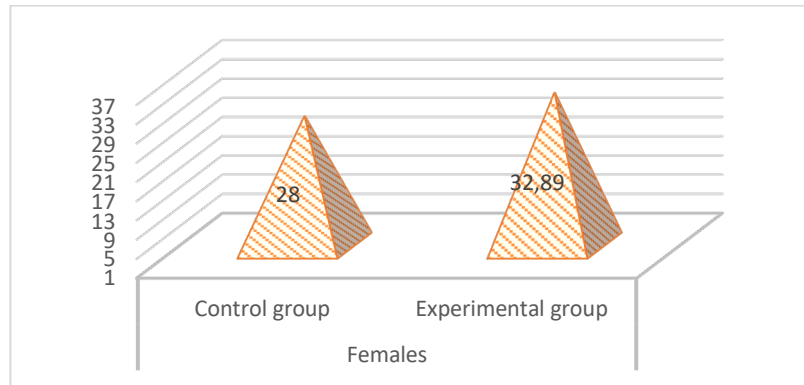
Figure 53. Comparison between females in the control and experimental groups

The average scores of females in the experimental and control groups were compared in order to find which had learned better. The mean here indicates that female students in the experimental group got M=32.89; while females in the control group got M=28. Therefore, the female who learned English vocabulary with online computer games had learned more vocabulary than those who had learnt in the traditional way.

4.6. Gender and learning English vocabulary with online computer games

Learners in the experimental group achieved better results in the post-test than the control group but, does the way of learning affect male and female students differently? To answer this question, the researcher tested the following null hypothesis:

There are no statistically significant differences at α ≤ 0.05 in the achievement level between male and female students in the experimental group and male and female students in the control group.

To answer this, the researcher used Two Way ANCOVA in the achievement level in the experimental group and in the control group due to gender as shown in Table 21. Also frequencies, means, standard deviations were used for the group and gender; and T-Test independent samples to measure the differences in the achievement between the experimental groups (male and female) and the control groups (male and female) in the post-test.

Table 21
The achievement level between the male and female students within the experimental group and the control group

Source	Sum of Squares	D.F.	Mean of square	F	Sig.
Pre	74.723	1	74.723	1.501	0.224
Group	1126.008	1	1126.008	22.622	*0.001
Gender	806.596	1	806.596	16.205	*0.001
Group * Gender	71.312	1	71.312	1.433	0.235
Error	4280.580	86	49.774		
Corrected Total	6537.187	90			

In order to assess the achievement level for male and female students in the same group, Two Way ANCOVAs were employed. These results proved the previous findings that learning English vocabulary is indeed affected by gender (male and female), and group (control and experimental).

On the other hand, when comparing gender within the same group the sig=0.235 (p>0.05), which means that males and females within each group have a similar score average. It was indicated that males and females learn English vocabulary similarly when using the same method of learning.

Palestinian teachers also had the same opinion as showcased in Figure 54 below:
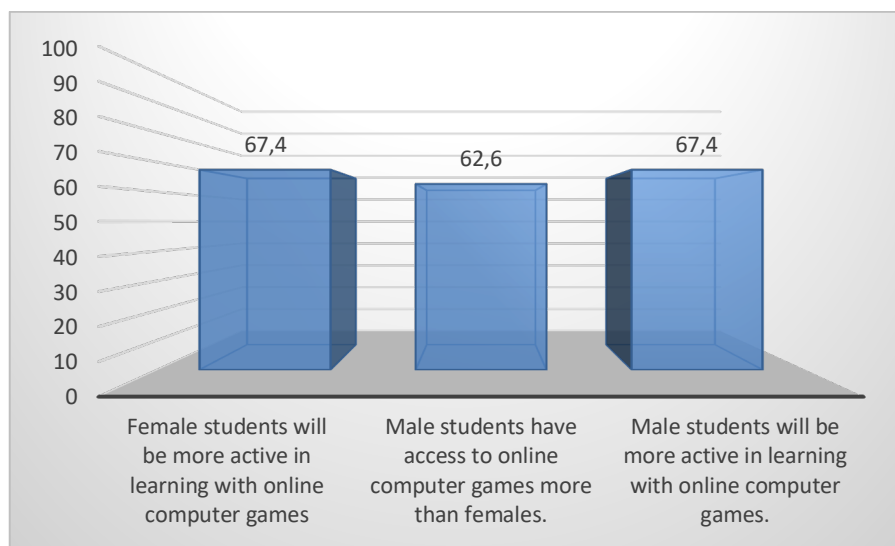
Figure 54. Students' gender and online games.

The same number of teachers (67.4%) had a similar opinion for the items: "Female students will be more active in learning through online computers games" and "male students will be more active in learning with online computers games" which proves that teachers also agreed that male and female students would get the same results if they learnt with a similar tool.

Also, when teachers were asked if students gender affected their accessibility and use of online computer games, 62.4% of teacher agreed that "Male students have access to online computers games more than females".

By comparing the two methods, it is clear that students who learnt through using online computer games outperformed the control group.

4.7. Summary

In this chapter, the two research tools results were discussed in order to answer the research questions. The questionnaire results were used in the first question to give information about Palestinian teachers' opinions on using online computer games in learning English vocabulary. Also, some of the items were integrated with the second tool which is the experimental study and the pre- and post-tests. Finally, the achievement test scores (pre- and post-tests) were analysed and utilized to answer the second, third and fourth questions.

CHAPTER V

DISCUSSION OF FINDINGS

5. Discussion of findings

This study has aimed to investigate the influence of using online computer games on learning English vocabulary for Palestinian elementary students. In this chapter the researcher discusses and compares the previous results of the questionnaire and the vocabulary tests according to the research questions formulated for this study. Then the researcher relates the current findings to previous results. Thus, it may be useful to mention the research questions before discussing these results.

5.1. Research question one

RQ1: Does the use of online computer's games have a positive influence on learning English vocabulary from the teachers' perspective?

In order to answer this question, the researcher used the questionnaire data and they were analysed to answer the question by finding out the Mean, standard deviation, percentage and level of each component. Then T-Test, and One-way ANOVA for independent samples were used to find if the independent variables affect teachers' perspective or not. Furthermore, researcher discussed this question in four themes: Palestinian Teachers' opinion on teaching and learning vocabulary; on using online computer games in education; the advantages of using online computer games in education and in learning English vocabulary.

5.1.1. Palestinian Teachers' opinion on teaching and learning vocabulary

Since this study focuses on learning vocabulary, it was important to know Palestinian teachers' opinion about teaching and learning English vocabulary. Palestinian teachers believe that teaching English vocabulary is the most important job for English teachers. In addition, 64.6% of teachers answered that Palestinian students think that learning English vocabulary is the most difficult task and this agreed with Agudo (2014) who concluded that what students believe about learning English will affect their learning outcome, so teachers need to encourage students to learn. Most English teachers answered that their students have problems in understanding comprehension texts because of their lack of vocabulary. This

correlated with Sedita (2005) who stated that students cannot understand comprehension texts if more than 10% of the words in the text are unknown. Similarly, Folse (2008) found that to develop students' comprehension skills, students need to learn more vocabulary since without a great deal of vocabulary, students could not succeed in comprehension.

Palestinian English teachers believe that to encourage students to learn vocabulary, teachers should keep their students active. Based on this, Farjami and Aidinlou (2013) claimed that learning vocabulary in a foreign language is the most difficult task for teachers and students so teachers should use activities and strategies to motivate students to learn, and to enhance vocabulary (Al-Zahrani, 2011). Some of the preferred strategies for students in learning vocabulary are indirect strategies (Taheri,2014) as teachers answered that students learn better when teachers focus on something else, but the activities focus on vocabulary (Oxford,1990). On the contrary, Verliyani (2016) claimed that direct strategies are very important in learning vocabulary especially when using the "Ostensive Approach" like pictures, realia and body movement. Nevertheless, it does not matter if teachers utilize direct or indirect strategies to enhance vocabulary learning. It is more important to use appropriate strategies for the students (Ta'amneh, 2015), since students learn better when they are able to see, do and hear (House, 1997).

5.1.2. Palestinian teachers' perspectives on using online computer games in education

The results showed that Palestinian teachers agree on the positive influence of using online computer games in learning English vocabulary. All the questionnaire components had a high level of response at more than 70% and the first component "Teachers perspectives toward using online computer games in teaching English vocabulary" had 74.1% and a mean of 3.71. This level of agreement showed how strongly teachers believe in the importance of using online computer games in learning and teaching vocabulary. The research by Awan (2011); Beavis (2014) and Prensky (2005) showed that teachers have a positive perspective on using ICT in teaching. This was considered to be a shift in their attitudes compared to their attitudes in the past and they consider this way as very beneficial for students. In addition, Noraddin (2015) found that teachers have positive opinions because they think that

learners are motivated in a game-based learning context and this encourages them to participate.

Although a great number of teachers have a positive attitude toward online computer games, and they believe that online computer games should be used in teaching vocabulary, slightly more than half of teachers 54.7% agreed that they actually use online computer games in teaching English. Moreover, three out of ten teachers neither agreed nor disagreed that they use online computer games. This was explained by Ray, Powell and Jacobsen (2015) who claimed that teachers have a positive attitude toward using video games in education but most of them do not know if they are useful or not, or how to use them. However, teachers have mixed feelings about gamification, they believe in it but they do not use the games themselves (Alabbasi, 2018). Teachers' opinions may be affected by their real-life use of online computer games. It was found that teachers do not play games or use them in the classroom because they think they are violent and not appropriate in education (Chick, 2012).

However, nearly half of the Palestinian teachers questioned (52.4%) have limited facilities for using online computer games in their schools and this affects the percentage of teachers who agreed about the positive effects of using them. These results correlate with those of ELSPA (2006); and Ellis et al. (2006) who concluded that without internet connection and facilities, applying online computer games would be impossible.

Teachers' use of online computer games is affected by a variety of factors such as: teachers' limited knowledge about them (Chik, 2012) as they have a little or no experience with games at home so they do not use them in classrooms (Pavlou, & Vryonides, 2009); or a lack of educational games (Yilmaz, 2015), and time (Ellis et al., 2006). (For more information see chapter II).

On the other hand, Palestinian teachers' gender, age, academic qualification, professional experience in teaching English as a foreign language, school of Teaching and level stage of teaching did not affect teachers' perspectives toward using online computer games. This result is the opposite of the findings of Hamari and Nousiainen (2015) and Pavlou and Vryonides (2009) who claimed that teachers' age and gender affect their attitudes

toward using computer games: older teachers use computers less than younger teachers. Moreover, female teachers agree more than male teachers on using computers in the classroom. Also, NFER Teacher Voice Omnibus (2009) showed that teachers who are younger than 46 years old use online games less, and elementary teachers use them more than secondary school teachers. Markopoulos et al. (2016) added that the success of using online computer games in the classroom depends on three main elements: computer access, learning procedure and the students and the teachers.

5.1.3. The advantages of using online computer games in education according to teachers' opinion

Palestinian teachers agreed that English teachers should use online computer games to teach vocabulary because they have many advantages in education and students' performance as they attract students' attention (86.5%), and motivate students to be more active (84.9%). Online computer games play a significant role in overcoming learning problems as they help shy students to participate (87.3%); make slow learners learn better (79.4%); and solve students' weaknesses in vocabulary (67.6%) This was agreed by Spingytė and Jasnauskaitė (2017) who found that online computer games are the best way for shy students to learn as they help them to participate more freely. Similarly, Reinders and Wattana (2012) added that online games in the classroom create a relaxed atmosphere in which decreases students' anxiety. Ahmad and Jaafar (2011) showed that applying online games for learning and teaching vocabulary does not only have a positive influence on learning but they also improve students' personalities and they develop their social skills to discuss, solve problems and collaborate with others. Markopoulos et al. (2016) claimed that this way creates a good teacher-student and student-student relationships; it increases students' confidence to try and to learn and makes shy students depend on themselves, so this empowers them.

The best way to attract the Net generation's attention is by using online games (Sharp, 2012). Students prefer to learn vocabulary through new strategies because this motivates them to learn (Al-Lahham, 2016). Also, students can learn anything they want with online games since they stimulate their ability to learn (Sharp, 2012). Teachers agreed that students

do prefer to learn via online computer games and this is in agreement with Griffiths's (2002) findings which showed that online computer games attract students' attention, as they overcome lots of boundaries like age and gender (Ta'amneh, 2015). Ellis et al. (2006) pointed out that learners like to learn by playing online computer games and using technology more than in the traditional way because they create a relaxing and fun atmosphere in the classroom which encourages learning.

5.1.4. The advantages of using online computer games in learning English vocabulary in the teachers' opinion

It was agreed that online computer games have lots of advantages for students' learning of English vocabulary. Teachers believe that they improve students' ability to learn vocabulary (85.7%); improve students' ability to use and learn vocabulary (84.1%); connect students with learning vocabulary at home (77.8%); and stimulate students' interest in learning vocabulary (90.4%). So, as teachers agreed, using online computer games in revising vocabulary helps students to remember words (90.4%); encourages students to recall vocabulary (86.5%); and increases students' productivity in vocabulary (84.9%). These findings are supported by Markopoulos et al. (2016); Moeller and Catalano (2015); Kaluga et al. (2013); and Yip and Kwan, (2006) who stated that online computer games not only help students to memorize the vocabulary, but they also motivate them to practice FL vocabulary and know its correct spelling, pronunciation and usage. Ang and Zaphiris (2008) added that online games motivate students to learn vocabulary and practice it in or out the classroom. Moreover, Kiliçkaya and Krajka (2010) pointed out that vocabulary is very difficult to learn so using online computer games will make it easier as it helps students to memorize and recall the words without obstacles.

Furthermore, online computer games help students to learn effectively. Griffiths (2002) showed that video games have a positive influence on students' learning of vocabulary since they make students learn it effectively and they are a good tool for improving some of the learning skills. Rankin et al. (2009) conducted a study with children and found that learners' vocabulary was improved by the use of online computer games and this happened faster than with their peers who did not use online computer games. Moreover, Donmus

(2010) claimed after conducting experimental research with English learners that this strategy increases students' learning of English vocabulary.

5.2. Research question Two

RQ2: Are there significant differences in the means in the achievement level between the students who learn English language through online computer games (experimental group) and those who learn English language through the traditional method (control group)?

The results of the second question showed that the students in the experimental group who studied with online computer games outperformed the students in the control group who learnt with the traditional method. So, this revealed that using online computer games affects students' learning and increases their vocabulary acquisition. According to the researcher's observation in the classroom during the experiment, the control group's learning was affected by lack of motivation. The control group students were less motivated to learn vocabulary in the traditional way especially when they noticed that their counterparts in the experimental group were learning with online computer games. The stimulation of female students was better in learning vocabulary than male students in the control group and this affected their results. More male students than female students in the control group got lower marks in the post-test than in the pre-test. However, students in the experimental group were more motivated to learn with online computer games, and this is clear from their results in the post-test as clarified in chapter IV about students' scores.

This finding was supported by Aghlara and Tamjid (2011), Calvo-Ferrer (2017), and Vahdat, & Behbahani (2013) who concluded that students who learn with games performed better than their counterparts who studied in the traditional way. Also, it was found that when educational computer games were used with Palestinian elementary students, they learnt better (Qteefan, 2012).

This was also confirmed by Lin (2014) who found that learners who learn via online computer games can recall vocabulary easily, and their language becomes better. Besides, Donmus (2010) revealed the efficiency of using games in learning foreign languages as they

stimulate students' positive attitudes and improve the memorization process. In addition, Kangas (2010), Kim et.al (2009), and Judge (2005) stated that educational computer games have great effectiveness on English achievement in general and they increase English vocabulary achievement in particular since they stimulate students' interest to learn and create an appropriate and interesting learning atmosphere (Kose et al., 2016; Turgut and Irgin, 2009; Yildirim, 2017).

What makes online computer games very significant in education in general and in learning vocabulary in particular is that online computer games and video games improve students' skills: cognitive skills, methodological skills, technical and language skills, teamwork skills and self-critical capacity (Ahmad, & Jaafar, 2011; González, & Izquierdo, 2012).

Moreover, video games contain pictures, sounds, images, actions, dialogue and words (Gee, 2012), and this helps students acquire vocabulary since the best way to learn vocabulary effectively is by sound, pictures, repetition and written form as using a combination of these is the best way to memorize new words (Alqahtani, 2015; Verliyani, 2016). In addition, online games give players an authentic setting in which they deal with vocabulary in their written and spoken forms (Ghanbaran, & Ketabi, 2014; Young, & Wang, 2014).

Online computer games have many characteristics which make them appropriate in language learning and help in acquiring vocabulary as explained in chapter II.

5.3. Research Question Three

RQ3: Are there significant differences in the means in the achievement level between the high achievers and low achievers in the experimental group and their counterparts in the control group?

The findings of this question showed that low and high achievers who learn English vocabulary with online computer games were affected more than those who learn with the traditional method, and the effect is more obvious for the high achievers in the experimental groups. This result is controversial since most of the previous studies investigated digital

games' effects on both levels of achievers without comparing them. For example, Qteefan (2012) indicated that educational games influenced both high and low achievers. In addition, 79.4% of Palestinian teachers believe that online computer games help slow learners to learn better. Similarly, it was found by Taheri (2014) that online games encourage slow students to learn new words effectively (Taheri ,2014).

On the contrary, Vasileiadou and Makrina (2017) compared the results of high and low achievers and they found that online computer games affect low achievers more than high achievers.

5.4. Research question four

RQ4: Are there significant differences in the means in the achievement level between the experimental group and the control group due to gender?

The findings of this question showed that female students acquire English vocabulary better than male students in both groups. This result correlates with previous studies like Qateefan, (2012), and Harb (2007) who found that female students learn English vocabulary better than males in general. The current research also found that females in the experimental and the control groups learnt more vocabulary than their male counterparts. Also, it can be seen from the results that females in the experimental group learnt the most. Similarly, Llach and Gallego (2012) showed that female students learn and gain vocabulary better than male students in the classes from first to third grades. But after these grades, males gain more vocabulary than females. In contrast, Fernandez-Malpartida (2017) found out that female learners got lower marks than male learners in vocabulary in the achievement test. Also, when using video games in education, females have not shown any noticeable achievements or even stimulation in their tests (Kappers, 2017) and males learnt more vocabulary than females (Vahdat, & Behbahani, 2013).

On the other hand, when comparing male and female students' results in each group the results showed that learners are equally affected by the use of each learning. Online computer games affected both female and male students in the experimental group equally, and both genders showed progress in their vocabulary achievements. This result was also

indicated from teachers' opinions that both male and female students will show the same degree of influence. The same number of teachers (67%) answered that female students will learn English vocabulary better via online computer games and (67%) said that male students will learn better with online computer games. This result has previously been described by Qteefan (2012) and Qulbein (2004) who claimed that educational games affect female and male students equally and there are no significant differences between male and female students in the experimental group.

In contrast, some researchers (e.g. Brown et al., 1997; Harb, 2007; Shahrori, & Remawi, 2011) found that digital games affect gender differently. Male learners are affected more than female learners since they tend to use computer games in their everyday lives more than girls (Shahrori, & Remawi,2011 and Vahdat, & Behbahani, 2013). Similarly, Brown et al. (1997) conducted a study to examine the gender difference in video-game performance. They concluded that males perform better than females in video games, but that both genders improve significantly in their vocabulary skills with video-game use. Hartmann, & Klimmt (2006) said that girls have a weaker interest in playing video games than boys. This can be explained by Reese (2007) who claimed that playing video games reduces females' ability to employ their knowledge to their learning. It is important to relate knowledge with previous experience during the learning process but females do not have the ability to do that as they cannot "achieve goals, develop strategies, and cooperate in groups while competing" (Jones, 2005, p. 2). While, Harb (2007) pointed out that female students were affected more by educational games than males since they concentrate more through doing activities.

This did not relate to females' ability to use games but their interest in playing a game since most games have been designed for males (Griffiths, 1996). Gender affects the type of games learners play and the amount of time they spend playing (Sundqvist, 2009). This was explained more in chapter II.

Since using online computer games affected both genders positively, they could be used in the classroom. However, Fernandez-Malpartida (2017) claimed that teachers should use the strategies that suit students' age, ability and interest in order to lead them to success and better achievement.

CHAPTER VI

CONCLUSION, IMPLICATIONS,

RECOMMENDATIONS

AND LIMITATIONS

6. Conclusions, implications, and recommendations

In this chapter the researcher summarizes the findings of the study and goes on to draw a conclusion. Also, this chapter describes the implications of the study, gives some recommendations for teachers, supervisors, the Ministry of Education and games programmers and researchers. And finally, the limitations are identified.

6.1. Summary of the findings

The first research question was about Palestinian EFL teachers' perspectives toward using online computer games in learning English vocabulary. The results revealed four main findings. Firstly, teachers agree on the difficulty that students face in learning vocabulary and that they should activate students to learn better. Secondly, teachers do believe that using online computer games can have a positive influence on learning English vocabulary. Thirdly, using online computer games leads to great benefits for students in learning such as increasing their motivation to learn, practicing using new vocabulary and connecting students to learning vocabulary at home. Finally, teachers' independent variables (gender, age, academic qualification, teachers professional experience, school of teaching and level stage of teaching) do not affect their opinion about using online computer games. However, half of the teachers 52.4% agreed that they have limited internet connections and facilities in their schools, and this can be considered one of the obstacles that affects the teachers' use of online computer games.

The second research question was about whether online computer games affect students' level of achievement or not. The results showed that students who learn with online computer games have a better achievement level in the post-test than those who learn in the traditional way.

The third question asked if there are significant differences between low and high achievers in the experimental and groups. The findings proved that students with both high and low marks in the experimental groups got better results than the control group students in the post-test, but students with high marks in the pre-vocabulary-test improved more with online computer games than the students with low grades.

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The last question focused on how students' gender affects their learning of vocabulary. The results showed that female students in general learn English vocabulary better than male students. Moreover, females in the experimental group did better than females in the control group. On the other hand, when comparing gender within the control and experimental groups, the results showed that males and females in the same group learn in the same way which obviously shows the effectiveness of online computer games in improving English vocabulary for both genders.

6.2. Summary related to research hypotheses

HYP.1: *Learners in the control and experimental groups will get similar marks in the pre-test.* This hypothesis was proved since the study revealed that learners in the control and experimental groups got almost identical marks in the pre-test. In fact, students in all groups got almost the same marks in the pre-test which was expected since the students' level before the experiment was the same.

HYP. 2: *The achievement level will be better for the students who learn English vocabulary through online computer games (experimental groups) than those who learn English vocabulary through the traditional method (control groups).* Hypothesis 2 was also proved since the research insured that achievement level in learning vocabulary was better for the students who learnt English vocabulary through online computer games (experimental groups) than those who learnt English vocabulary through the traditional method (control groups).

HYP. 3: *The low achiever learners who learn with online computer games (experimental groups) will learn English vocabulary better than the low achievers who learn in the traditional way (control groups).* The findings of this study claimed that hypothesis 3 was also proved as the low achievers who used online computer games in their studies (experimental groups) learnt English vocabulary better than the low achiever who studied in the traditional way (control groups).

HYP. 4: *In the experimental group, male students will outperform female students in the achievement test.* The last hypothesis was rejected as the study found that male and female

students learn vocabulary with online computer games similarly. It is confirmed that there are no differences in the achievement test between male and female students in learning vocabulary with online computer games.

6.3. Conclusions

Online computer games can be defined as video games, digital games or computer games that players play via a computer or laptop and with Internet connection. There are two types: online games without connecting with other players, and games in which players connect with each other: "Massive Multiple Online Role-Playing Games (MMORPGs)". These games can be utilized in language learning in two ways: as online digital game-based learning in which the games focus on specific educational goals. Or, online digital game-enhanced learning in which the gamers concentrate on playing and enjoying the game and while playing, gain some skills and vocabulary. It is important to know that when commercial and vernacular games are used in education for specific reasons, this makes them game-based learning games. For this study, the researcher used online educational games in which students did not connect online (MMORPGs). Instead, online digital game-based learning was used which is more appropriate for the students age, culture and the learning aims.

What makes Online computer games one of the important tools in learning English is that it gathers different vocabulary learning strategies and approaches in one tool (e.g. implicit, explicit, incidental, formal, informal and natural learning). Also, they contain different elements which lead to efficient learning such as: goals, rules, motivation, feedback, fun, competition and problem solving. Besides, their design which contains pictures, sounds, emotions, images, music and words, create an interesting setting for learning. Moreover, OCGs improve students' skills like: problem solving, group working and independent working as well as the language skills, speaking, writing, reading and listening.

Online computer games play a vital role in learning English vocabulary and they have many advantages for students such as: helping shy students to participate, slow learners to learn better, improving students' ability to learn vocabulary, enriching students' knowledge, connecting students with learning vocabulary at home, and stimulating students' interest. This was revealed by the Palestinian teachers in their responses to the questionnaire.

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However, what really affects teachers' use of online games in their classroom is the lack of facilities and limited internet connection. In addition, it is said that the lack of teachers practical training is the main problem, rather than the teachers age, gender, level of the education system, type of school, years of experience, or qualifications. However, Palestinian teachers have a lack of information about online games and this is clear from the highest neutral percentages in response to some items.

From the other research tool (vocabulary tests), the researcher found that using online computer games lead to better learning, better performance and better achievement. Students who used online computer games outperformed the other students who did not. In addition, when comparing students according to their achievement in the pre- and post-tests, it is proved that the low achievers and high achievers in the experimental group got higher marks in the achievement test than their counterpart in the control groups. But what is really significant is that the post-test results indicated that the high achievers improved even more than the low achievers. However, female students overall are better at learning vocabulary than male students in regards to achievement tests. Clearly, it was shown that the female experimental group did better than the female control one.

It is important to recognize that what makes online computer games appropriate for both genders and for students with different levels learn better is the multimedia in these games which helps students to connect vocabulary verbally and visually. This tool introduces words with sounds, pictures and letters which provide learners with different learning styles the ability to learn better. Also, learning English with online games increases students confident in playing, making mistakes and learning from them; whereas, in the traditional classroom they feel shy and afraid to participate and make mistakes.

In conclusion, it should be noted that if online games are designed and used in the right way this will motivate students to learn and to acquire the language easily as well as improve their skills.

6.4. Implications of the study

This research shed light on different suggestions in response to the results as follows:

- Using online computer games motivates students to learn English in general and English vocabulary in particular.
- Both female and male learners learn better by using online computer games.
- Using online computer games has a positive influence on low achievers.
- Teachers should be aware of the advantages of online computer games for students' learning of vocabulary.
- Online computer games have a great influence on high achievers to be better and learn vocabulary more effectively.
- Online computer games motivate all students to participate especially shy students.
- Online computer games give students immediate feedback so they can improve their knowledge.
- Online games give the students different options and students can choose the ones that best suit their abilities and interests.
- Online computer games teach students not only vocabulary but also spelling, pronunciation and how to use the new words.
- Children learn better by what they hear and see so this way makes them learn more effectively.
- Teachers should learn more about online computer games and use them in the classroom.
- Online computer games can help to attract students' attention, improve concentration and learn the four language skills.
- Online computer games help to create a fun atmosphere and create friendly relationships between teachers and pupils.
- Different types of games: individual, pair and group work games improve student- student relationships.

6.5. Recommendations

Associated with the research results and limitations, the researcher recommends the following:

A) Recommendation for teachers

- To use online computer games in teaching English in the classroom.
- To learn more about online computer games to be able to use them correctly.
- To activate students and attract their attention using what they like.

B) Recommendations for supervisors

- To provide training courses that help teachers implement the online computer games strategy in teaching English.
- To familiarize teachers with using online computer games by conducting workshops
- To increase students' awareness by preparing instructional materials about online computer games strategies and distribute them to teachers.
- To draw teachers' attention to the importance of using online computer games as a teaching strategy.

C) Recommendations for the Ministry of Education

- To provide schools with internet connection and computer facilities to encourage teachers to use online games.
- To include activities in the English curriculum that could be completed using online computer games.
- To encourage supervisors and teachers to use this strategy in the classroom.

D) Recommendations for programmers

- To create online computer games for educational purposes to help students to learn effectively.
- To cooperate with teachers to create appropriate games.

E) Recommendations for researchers

- To carry out more studies into online computer games and their effects on learning different subjects.

- To investigate the perspectives of teachers with a variety of nationalities on using online computer games in learning English vocabulary.

- To do experimental research with other students in different contexts.

6.6. Limitations of the study

This study has some limitations that should be mentioned despite them not having any effect on the experiment's results with regards to sampling, scope and research methods. The first limitation was using four separate groups for male and female students. This was done because male and female students learn in separate schools and separate classes, as explained in chapter III.

The second limitation was the difficulty in finding schools in the Salfit district that have internet connection and enough computers for all the students. This caused two problems: the number of participants in each group was different; and the male groups are larger than the female groups. Moreover, the number of male students in the control group is higher than in the experimental group. Furthermore, males and females used different tools, females used laptops to study; whereas, males used desktop computers. So, this may affect the results and students' motivation as female students were more motivated to learn and play than male students.

The third limitation is that this study is the first one in Palestine that investigated the effect of online computer games on learning English vocabulary that lead the researcher, who was also the teacher, to build the implementation program. Thus, preparing for the experiment in which the teacher chooses the games and deciding the order in which to play them and how to do the implementation took time and effort on the part of the researcher. This makes it a new and unique experience.

Lastly, there was a lack of online computer games for educational purposes which made choosing games that fit the learning aims difficult and time consuming.

6.7. Further research

Review of the recent literature and the findings in the present study shed light on some ideas for future studies in Palestine. Related to the present study, new research could

be carried out with Palestinian secondary school students using Massive Multiple Online Role-Playing Games which may be used as a game-based learning tool to teach vocabulary. Experimental methods should be used as well as interviews with students after each session to understand students' opinions about this tool.

Another study about the impact of online computer games on the interaction and learning for students with special educational needs like Dyslexia or Autism should be undertaken. The researcher will use case studies with observation tools to assist students when playing the games.

REFERENCES

Abo Ja'far, M. (2014). *The developmental Psychology*. Libyan School book. Libya, Ministry of education: The Center of Educational Curricula and Pedagogical Research.

Abrams, S., & Walsh, S. (2014). Gamified Vocabulary: Online Resources and Enriched Language Learning. *Journal of Adolescent & Adult Literacy*, *58(1)* 49-58. doi:10.1002/jaal.315.

Adger, C.T. (2002). *What Teachers Need to Know about Language*. McHenry, IL: Center for Applied Linguistics.

Adolphs, S., & N. Schmitt (2003). Lexical coverage of spoken discourse. *Applied Linguistics*, *24*(4), 425-438. Retrieved from http://www.norbertschmitt.co.uk/#untitled41

Aghlara, L., & Tamjid, N.H. (2011) The Effect of Digital Games on Iranian Children's Vocabulary Retention in Foreign Language Acquisition. *Procedia-Social and Behavioral Sciences, 29,* 552-560. http://dx.doi.org/10.1016/j.sbspro.2011.11.275

Agosto, D. (2004). Girls and gaming: A summary of the research with implications for practice. *Teacher Librarian, 31*(3), 8-15.

Agudo, E. J., Rico, M., & Sánchez, H. (2015). Multimedia games for fun and learning English in preschool. *Digital Education Review, 0*(27), 183–205.

Agudo, J. D. D. M. (2014). Analysing Spanish learners' beliefs about EFL learning. *Porta Linguarum*, *22*, 285–301.

Ahmad, I., & Jaafar, A. (2012). Computer games: implementation into teaching and learning. *Procedia - Social and Behavioral Sciences, 59,* 515 – 519. UKM Teaching and Learning Congress 2011. Published by Elsevier Ltd. doi: 10.1016/j.sbspro.2012.09.308.

Aitchison, J. (1994). *Words in the Mind: An Introduction to the Mental Lexicon*. Oxford: Blackwell.

Al-Darayseh, A. M. A. (2014). The Impact of Using Explicit/Implicit Vocabulary Teaching Strategies on Improving Students' Vocabulary and Reading Comprehension. *Theory and Practice in Language Studies*, *4*(6), 1109–1118. https://doi.org/10.4304/tpls.4.6.1109-1118

Al-Khatib, M., Abdel Malak, M., Sleiman, R., & Zadorian, H. (2010). Difficulties that Arab Students Face in Learning English Research Project. *Research Project,Arab Open University - Lebanon*, 1–28.

Al-Lahham, I. M. S. (2016). *The Effectiveness of Using Keyword Based-Instruction on Developing Eighth Graders' English Vocabulary and its Retention in Gaza* (Mater's thesis). The Islamic University, Gaza.

Al-Laqani, A. (1994). *Educational Curriculum Development*. Cairo: Modern Offset Printer.

Al-Shahrori, M. (2008). *Electronic games in an age of globalization.* Amman: Dar Al Masirah for Publishing and Distribution.

Al-Zahrani, M. (2011). *The Effectiveness of Keyword based Instruction in Enhancing English Vocabulary Achievement and Retention of Intermediate Stage Pupils with Different Working Memory Capacities* (Unpublished MA thesis). Taif University, Kingdom of Saudi Arabia.

Alabbasi, D. (2018). Exploring Teachers Perspectives towards Using Gamification Techniques in Online Learning. *TOJET: The Turkish Online Journal of Educational Technology, 17*(2), 34-45.

Alduais A. M. S. (2018). Teaching and Learning Vocabulary: Insights from Learning Styles and Learning Theories. *J Child Adolesc Behav, 6*(1).

Alessi, S. M., & Trollip, S. R. (2001). *Multimedia for learning: Methods and development.* Boston, MA: Allyn & Bacon.

Alfar, I. (2009). *Preparation and production of interactive multimedia software*, second edition. Tanta, Egypt: Delta Computer Technology.

Alghamdi, A. K., & AlAhmed, S. (2018). Effective Methods for Teaching English Vocabulary to Saudi Female Students. *Journal of Education and Learning (EduLearn)*, *12*(1), 118. https://doi.org/10.11591/edulearn.v12i1.9125

Alhaysony, M. (2012). Vocabulary discovery strategy used by Saudi EFL students in an intensive English language learning context. *International Journal of Linguistics, 4*(2), 518-535.

Allum, P. (2004). Evaluation of CALL: Initial vocabulary learning. *ReCALL, 16*(02), 488-501.

Aloraini, S. I. (2005). *Distance learning. Kingdom of Saudi Arabia.* Dammam: Alretha Press

Alqahtani, M. (2016). The importance of vocabulary in language learning and how to be taught. *International Journal of Teaching and Education*, *III*(3), 21–34. https://doi.org/10.20472/te.2015.3.3.002

Alsayegh, A. A. (2016). *Teaching English Vocabulary via Digital Games to 3ʳᵈ Level Saudi Male Stuents: Issues and Attitudes* (Ph.D dissertation). University of Limerick, Irland.

Amalia, S. (2005). Approach to Teaching and Developing Vocabulary. *Sturza Amalia*, 570–575.

Amara, M.H. (2003). Recent Foreign language education polices in Palestine. *Language Problems and Language Planning, 27*(3), 217-232.

Amirian, S. M. R., & Heshmatifar, Z. (2013). A Survey on Vocabulary Learning Strategies: A Case of Iranian EFL University Students. *Journal of Language Teaching and Research*, *4*(3), 636–641. https://doi.org/10.4304/jltr.4.3.636-641

Anderson, T. A. F., Reynolds, B. L., Yeh, X. P., & Huang, G. Z. (2008). Video games in the

English as a foreign language classroom. In M. Eisenberg, Kinshuk, M. Chang, & R. McGreal (Eds.), *The second IEEE international conference on digital game and intelligent toy enhanced learning* (pp. 188–192). doi: 10.1109/DIGITEL.2008.39

Ang, C. S., & Zaphiris, P. (2006). Developing Enjoyable Second Language Learning Software Tools: A Computer Game Paradigm. In Zaphiris, P., & Zacharia, G. (Eds.), *User-Centered Computer Aided Language Learning* (pp. 1-21). doi:10.4018/978-1-59140-750-8.ch001

Ang, C. S., & Zaphiris, P. (2008). Computer games and language learning. In T. T. Kidd and H. Song (Eds.), *Handbook of Research on Instructional Systems & Technology* (pp. 449-462). Hershey, PA: IGI Global.

Anghel, B., Carro, J. M., & Cabrales, A. (2012). *Evaluating a bilingual education program in Spain: the impact beyond foreign language learning*. Universidad Carlos III: Economics Series, Working Paper we1214.

Ansari, A. (2012). Teaching of English to Arab students: Problems and remedies. *Educational Research*, *3*(6), 519–524.

Ansari, M., Vahdany, F., & Sabouri, B. N. (2016). The Relationship between the Use of Vocabulary Learning Strategies and Gender of Iranian EFL Learners. *IJRELT*.

Apperley, T. (2006). Toward a critical approach to video game genres. *Simulation & Gaming, 37*(1), 6-23. Sage Publications 2006.

Apperley, T., & Beavis, C. (2011). Literacy into action: Digital games as action and text in the English and literacy classroom. *Pedagogies: An International Journal, 6*, 130-143.

Aqel, A. R. (2009). *An evaluative study of the Palestinian 11th grade English textbook from the teachers' perspective in Southern Nablus and Salfit Districts*. (Master's thesis). An-Najah National University, Nablus.

Arellano, D. (2017). Memory Learning Strategies in English as a Foreign Language in Vocational Studies. *Tendencias Pedagógicas*, 29, 229-248.

Arnseth, H. C. (2006). Learning to play or playing to learn - A critical account of the models of communication informing educational research on computer gameplay. *Game Studies, 6*(1).

Arslan, A. (2006). The Attitude Scale toward Making Computer Supported Education. *Journal of the Faculty of Education, 2*(2), 34-43.

Ashraf, H., Motlagh, F. G., & Salami, M. (2014). The impact of online games on learning English vocabulary by Iranian (low-intermediate) EFL learners. *Procedia-Social and Behavioural Sciences*, *98*, 286-291. https://doi.org/10.1016/j.sbspro.2014.03.418

Askildson, L. R. (2011). A review of CALL and L2 reading: Glossing for comprehension and acquisition. *International Journal of Computer-Assisted Language Learning and Teaching*, *1*(4), 49–58.

August, D., Carlo, M., Dressler, C., & Snow, C. (2005). The critical role of vocabulary development for English language learners. *Learning Disabilities Research and Practice, 20*(1), 50–57.

Awan, R. N. (2011). Can playing computer based games positively affect ICT attitudes amongst teachers? A case study of teachers' experiences using educational multimedia games as teaching and learning resources in Dubai public schools. *Education and Management Technology, Icemt 2011*, *13*, 226–234.

Awwad, A. A. (1997). *Educational Psychology and learning Disabilities*. Alexandria: The scientific office for computer and publication.

Azar, A. (2012). The Effect of Games On EFL Learners' Vocabulary Learning Strategies. *International Journal Of Basic and Applied Science, 1*(2), 252-256. Retrieved from: http://www.insikapub.com/

Baek, Y. K. (2008). What hinders teachers in using computer and video games in the classroom? exploring factors inhibiting the uptake of computer and video games. *Cyber Psychology & Behavior, 11*(6), 665-671. doi:10.1089/cpb.2008.0127

Baker, J., Parasuraman, A., Grewal, D., & Voss, G. B. (2002). The influence of multiple store environment cues on perceived merchandise value and patronage intentions. *Journal of Marketing*, *66*(2), 120-141.

Baltra, A. (1990). Language learning through computer adventure games. *Simulation and Gaming Journal, 21*, 445-452.

Bandura, A. (2006). Toward a psychology of human agency. *Perspect .Psychol. Sci. 1*, 164–180. doi:10.1111/j.1745-6916.2006.00011.x

Baniabdelrahman, A. A. (2013). The Effect of Using Online Tools on Ninth Grade Jordanian Students' Vocabulary Learning. *Arab World English Journal, 4*(1), 189-202.

Barab, S. A., Gresalfi, M., & Arici, A. (2009). Why educators should care about games. *Educational Leadership, 67*(1), 76-80.

Barakat, B. F. (2007). The struggle for Palestinian national education past and present. C. Brock, & L. Z. Levers (Eds). *Aspects of Education in the Middle East and North Africa*. Oxford: Symposium Books.

Bartle, R. (1996). *Hearts, Clubs, Diamonds, Spades: Players Who Suit Muds*.

Bastanfar, A., & Hashemi, T. (2010). Vocabulary Learning Strategies and ELT Materials; A Study of the Extent to Which VLS Research Informs Local Coursebooks in Iran. *International Education Studies, 3(*3), P158.

Bastanfar, A., & Hashemi, T. (2014). Vocabulary Learning Strategies and ELT Materials; A Study of the Extent to Which VLS Research Informs Local Coursebooks in Iran. *International Education Studies*, *3*(3), 158–166. https://doi.org/10.5539/ies.v3n3p158

Bayne, S., & Ross, J. (2007). *The 'digital native' and 'digital immigrant': a dangerous opposition.* Paper presented at the Annual Conference of the Society for Research into Higher Education (SRHE) December 2007.

Beck, I., McKeown, M., & Kucan, L. (2002). *Bringing words to life.* New York: The Guilford Press.

Becta (2001). *Computer Games in Education project.* At www.becta.org.uk/research/research.cfm?section=1&id=2826,

Becta. (2004). A review of the research literature on barriers to the uptake of ICT by teachers. *British Educational Communications and Technology Agency (BECTA)*, *1*, 1–29. https://doi.org/http://dera.ioe.ac.uk/1603/1/becta_2004_barrierstouptake_litrev.pdf

Begg, M., Dewhurst, D., & Macleod, H. (2005). Game Informed Learning: Applying Computer Game Processes to Higher Education. *Innovate*, *1*(6).

Bell, N. D. (2005). Exploring L2 Language Play as an Aid to SLL: A Case Study of Humour in NS-NNS Interaction. *Applied Linguistics*, *26*(2), 192-218.

Bennett, S., & Maton, K. (2010). Beyond the "digital natives" debate: towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning, 26,* 321 –331. http://dx.doi.org/10.1111/j.1365-2729.2010.00360.x.

Bennett, S., Maton, K., & Kervin, L. (2008). The "digital natives" debate: a critical review of the evidence. *British Journal of Educational Technology, 39*(5), 775–786. http://dx.doi.org/10.1111/j.1467-8535.2007.00793.

Benson, P. (2001). *Teaching and researching autonomy in language learning.* Harlow, England: Longman. http://dx.doi.org/10.1057/9780230306790

Benson, P., & Reinders H. (2011). *Beyond the language classroom.* Basingstoke, UK: Palgrave Macmillan. https://doi.org/10.1057/9780230306790_2

Bernaus, M., Wilson, A., & Gardner, R. (2009) Teachers' Motivation, Classroom Strategy Use, Students' Motivation and Second Language Achievement. *LainnugeulaVruemz*, 25-36.

Bertozzi, E. (2014). Using games to teach, practice, and encourage interest in STEM subjects. In K. Schrier (Ed.), *Learning and education games volume one: Curricular and design considerations* (pp. 23–36). Pittsburgh, PA: ETC Press.

Birch, D., & Sankey, M. (2008). Factors influencing academics‟ development of multimodal distance education courses. *International Journal of Educational Development using ICT, 4*(1).

Bisson M. J., van Heuven W. J. B., Conklin K., & Tunney R. J. (2013). Incidental acquisition of foreign language vocabulary through brief multi-modal exposure. *PLoS One, 8*(4).

Bisson, M. J. (2013). *Incidental acquisition of foreign language vocabulary through multi-modal situations (*PhD thesis). University of Nottingham.

Blachowicz, C. L. Z., & Fisher, P. (2004). Vocabulary lessons. *Educational Leadership, 61*(6), 66-69.

Blake, R. (2011). Current trends in online language learning. *Annual Review of Applied Linguistics, 31*, 1–17.

Blake, R. (2013). *Brave new digital classroom: Technology and foreign language learning* (2nd edn). Washington DC: Georgetown University Press.

Boeker, M., Andel, P., Vach, W., & Frankenschmidt, A. (2013). *Game-Based e-learning is more effective than a conventional instructional method: a randomized controlled trial with third-year medical students.* PLOS ONE.

Bogost, I. (2007). *Persuasive Games: The Expressive Power of Videogames.* Cambridge, MA: MIT Press.

Bonk, W. J. (2000). Second Language Lexical Knowledge and Listening Comprehension. *International Journal of Listening, 14*(1), 14-31, DOI: 10.1080/10904018.2000.10499033

Boonkongsaen, N. (2012). Factors affecting vocabulary learning. *Naresuan University Journal, 20*(2), 45-53.

Bourgonjon, J., Valcke, M., Soetaert, R., & Schellens, T. (2010). Students' perceptions about the use of video games in the classroom. *Computers & Education, 54*(4), 1145–1156.

Brooks-Young, S. (2005). *Integration issues for 21st-century teachers. Today's Catholic Teacher.* Retrieved from http://www.peterli.com/archive/ tct/790.shtm

Broos, A. (2005). Gender and Information and Communication Technologies (ICT) anxiety: Male self-assurance and female hesitation. *Cyber Psychology & Behavior, 8*, 21-31. http://dx.doi.org/10.1089/cpb.2005.8.21

Brouillette, L. (2012). Supporting the language development of limited english proficient students through arts integration in the primary grades. *Arts Education Policy Review, 113*(2), 68–74. https://doi.org/10.1080/10632913.2012.656494

Brown, H. (2000). *Teaching by Principles an Interactive Approach to Language*. New York: Pearson Education Limited

Brown, H. (2007). *Principles of language learning and teaching.* White Plains, NY: Pearson Longman

Brown, R., Hall, L. R., Holtzer, R., Brown, S. L., & Brown, N. L. (1997). Gender and video game performance. *Sex Roles: A Journal of Research, 36*(11/12), 793-812.

Brown, R., Waring, R., & Donkaewbua, S. (2008). Incidental vocabulary acquisition from reading, reading-while-listening, and listening to stories. *Reading in a foreign language, 20*(2), 136.

Bruner, J. (1960). *The Process of Education.* New York: Vintage.

Bryant, T. (2006). *Using World of Warcraft and other MMORPGs to foster a targeted, social, and cooperative approach toward language learning, Academic Common*. Retreived from http://www.academiccommons.org/commons/essay/bryant-MMORPGs-for-SLA

Bryant, T. (2007). Games as an Ideal Learning Environment. *Nitle Transformations, 1*(2). 1-8.

Bryant, T. (2008). *From age of Empires to Zork: Using games in the classroom*. Retrieved from http://www.academiccommons.org/commons/essay/gamesinclassroom

Bull, S., & Ma, Y. (2001). Raising learner awareness of language learning strategies in situations of limited recourses. *Interactive Learning Environments, 9*(2), 171-200. doi: 10.1076/ilee.9.2.171.7439

Burns. (1972). *Teaching English to Children. From Practice to Principle.* Collins ELT: Prentice Hall.

Burton, J. K., Moore, D. M., & Magliaro, S. G. (1996). Behaviorism and instructional technology. In D. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 46–73). Washington, DC: Association for Educational Communications and Technology.

Butler, Y. G., Someya, Y., & Fukuhara, E. (2014). Online games for young learners' foreign language learning. *ELT Journal, 68(*3), 265–275.

Bytheway J. (2014). In-game culture affects learners' use of vocabulary learning strategies in massively multiplayer online role-playing games. *Int. J. Comput. Assist. Lang. Learn. Teach, 4*, 1-13. https://doi.org/10.4018/ijcallt.2014100101

Bytheway, J. (2011). *Vocabulay Learning Strategies in Massively Multiplayer Online Role-Playing Games* (Master's thesis). Victoria University of Wellington,Wellington.

Caillois, R. (1961). *Man, Play, and Games. Translated From the French by Meyer Barash.* United State of America: The Free Press of Glencoe, Inc.

Cakir, I. (2004). Designing Activities for Young Learners in EFL Classrooms. *GU, Gasi Egitim Dergisi, 24* (3), 101-112. Retrieved from http://gefad.gazi.edu.tr/article/view/5000078763.

Calvo-Ferrer, J. R. (2017). Educational games as stand alone learning tools and their motivational effects on L2 vocabulary acquisition and perceived learning gains. *British Journal of Educational Technology, 48*(2), 264-278. https://doi.org/10.1111/bjet.12387 Cameron

Cameron, L. (2001). *Teaching languages to young students*. Cambridge: Cambridge University Press.

Carlson, S. (2005). The Net Generation Goes to College. *The Chronicle of Higher Education, 52*(7). Retrieved from http://content.imamu.edu.sa/Scholars/it/net/the_net_generation.pdf

Carrier, M. (1991). Simulations in English language teaching: A cooperative approach. *Simulation and Gaming Journal, 22*(2), 224-33.

Carter, R. (2001). Vocabulary. In R. Carter and D. Nunan (Eds.), *The Cambridge Guide to Teaching English to Speakers of Other Languages* (pp. 42-47). Cambridge: Cambridge University Press.

Case, R. (1996). Changing views of knowledge and their impact on educational research and practice. In D. R. Olson & N. Torrance (Eds.), *The handbook of education and human development: New models of learning, teaching and schooling* (pp. 75–99). Cambridge: Blackwell.

Cassell, J., Jenkins, H. (1998). *From Barbie to Mortal Kombat: Gender and computer games*. Camrbidge, MA: The MIT Press.

Catalán, R. M. J. (2003). Sex differences in L2 vocabulary. *Rosa María Jiménez Catalán International Journal of Applied Linguistics*, *13*(1), 54–77.

Cedefop. (2009). *European guidelines for validating non-formal and informal learning. Luxembourg*: Publications Office.

Chamot, A. (1987). The Learning Strategies of ESL Students. In A. Wenden, & J. Rubin (Eds.), *Learner Strategy in Language Learning* (pp. 71-83). Englewood Cliffs, NJ: Prentice Hall, Inc.

Chang, H. B., Hsu, H. H., & Chao, L. R. (2008). Interactive video game platform for game-based learning. In F. Li, J. Zhao, R. Lau, Q. Li, & D. McLeod (Eds.), *Advances in web-based learning* (pp. 332-240). Berlin: Springer Heidelberg.

Chapelle, C. (1998). Construct definition and validity inquiry in SLA research. In L. F. Bachman, *Interfaces between second language acquisition and language testing research* (p. 32-70). Germany: Ernst KlettSprachen.

Chapelle, C. (1999). *Construct definition and validity inquiry in SLA research Part of the Bilingual, Multilingual, and Multicultural Education Commons, Curriculum and Social Inquiry Commons, and the Higher Education Commons*. Retrieved from http://lib.dr.iastate.edu/engl_pubs

Chapelle, C. A. (2001). *Computer applications in second language acquisition: Foundations for teaching, testing, and research*. Cambridge: Cambridge University Press.

Chatfield, T. (2010). *7 ways games reward the brain.* TED. Retrieved from http://www.ted.com/talks/tom_chatfield_7_ways_games_reward_the_brain.html

Chatfield, T. (2011). *Fun Inc.: Why games are the 21st century's most serious business*. London: Virgin Books.

Chatzivasileiou, C. P. (2010). *Elementary School Students' Understanding of Concept of Arithmetic Mean*. Proceedings of the Eighth International Conference on Teaching Statistics (ICOTS8, July, 2010), Ljubljana, Slovenia. Voorburg, The Netherlands: International Statistical Institute. www.stat.auckland.ac.nz/~iase/publications.php

Chen, M., & Johnson, S. (2004). *Measuring flow in a computer game simulating a foreign language environment.* Retrieved from http://www.markdangerchen. net/pubs/flow_in_game_simulating_fle.pdf.

Chik, A. (2011). Learner autonomy development through digital gameplay. *Journal of Digital Culture & Education, 3*(1), 30–45.

Chik, A. (2012). Digital gameplay for autonomous foreign language learning: Gamers' and language teachers' perspectives. In H. Reinders (ed.), *Digital games in language learning and teaching* (pp.95–114). Basingstoke: Palgrave Macmillan.

Choi, D., & Kim, J. (2004). Why people continue to play online games: in search of critical design factors to increase customer loyalty to online contents. *Cyber Psychology & Behavior, 7*, 11–24.

Chuang, T., Y., & Chen, W. F. (2007). Digital games for cognitive learning: A pilot study. *Journal of Scientific and Technological Studies, 41*(1), 17-27.

Cicchino, M. I. (2015). Using game-based learning to foster critical thinking in student discourse. *Interdisciplinary Journal of Problem-based Learning, 9*(2).

Ciocco, M. D., & Holtzman, D. (2008). *Teaching the Millennial Generation.* AACSB International Faculty Conference on Learning & Research, St. Pete Beach, Florida.

Clément, R., Baker, S. C., & MacIntyre, P. D. (2003). Willingness to communicate in a second language: The effects of context norms, and vitality. *Journal of Language and Social Psychology, 22*(2), 190-209.

Coady, J. (1993). Research on ESL/EFL vocabulary acquisition: Putting it in context. In T. Huckin, M. Hyanes, & J. Coady (Eds.), *Second language reading and vocabulary learning* (pp. 3-23). Norwood, NJ: Ablex.

Cognition and Technology Group at Vanderbilt (1991). Some thoughts about constructivism and instructional design. In T. M. Duffy, & D. H. Jonassen (Eds.), *Constructivism and the technology of instruction: a conversation* (pp. 115-119). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, A. D., & Macaro, E. (Eds.). (2007). *Language Learner strategies: Thirty years of research and practice.* Oxford: Oxford University Press.

Cohen, A. M. (2011). The gamification of education. *Futurist, 45*(5), 16–17.

Cole, M. & Cole, S. (2001). *The Development of Children.* New York: Scientific American Books. Distributed by W.N. Freeman and Company

Connaway, L. S., White, D., Lanclos, D., & Le Cornu, A. (2012). *Visitors and Residents: What Motivates Engagement with the Digital Information Environment?* In ISIC 2012 Conference Proceedings, Tokyo, Japan (2012). Electronic.

Cornillie, F., Jacques, I., De Wannemacker, S., Paulussen, H., & Desmet, P. (2011). *Vocabulary treatment in adventure and role-playing games: A playground for*

adaptation and adaptivity. Interdisciplinary Approaches to Adaptive Learning. A Look at the Neighbours. Springer, 131-146.

Cornillie, F., Thorne, S. L., & Desmet, P. (2012). ReCALL special issue: Digital games for language learning: Challenges and opportunities. *ReCALL*, *24*(3), 243–256. https://doi.org/10.1017/S0958344012000134

Corrales, L. L. (2011). *Teaching Vocabulary Learning Strategies: A Vocabulary Improvement Program (Vip) for EFL Beginner Students From Centro Cultural Peruano Norteamericano Arequipa* (Master's thesis). Universidad de Piura, Piura, Perú.

Corson, D. (1995). *Using English words.* Dordrecht: Kluwer Academic Publishers.

Coxhead, A., & Bytheway, J. (2015). Learning vocabulary using two massive online resources: you will not blink. In D. Nunan & R. Richards (Eds.), *Learning beyond the classroom* (pp. 65 - 74). London: Routledge. Coxhead

Crawford, Garry (2012). *Video Gamers.* London: Routledge.

Cross, J. (2007). *Informal learning: Rediscovering the natural pathways that inspire innovation and performance.* San Francisco, CA: Pfeiffer.

Dajani, D., & Mclaughlin, S. (2009). Implementing the First Palestinian English Language Curriculum: A Need for Teacher Empowerment. *Mediterranean Journal of Educational Studies, 14*(2), 27-47.

Dajani, M. (2015). Preparing Palestinian Reflective English Language Teachers through Classroom Based Action Research. *Australian Journal of Teacher Education*, *40*(40). https://doi.org/10.14221/ajte.2014v40n3.8

Daviault, C. (2000). *Look who's pulling the trigger now: A study of girls'/women's relationship with video games (*Master's thesis). Concordia University, Canada.

Deblois, P., & Oblinger, D. (2007). Learning Technologies that Serve Students. In G. L. Kramer (Ed.), *Fostering student success in the campus community*. San Francisco, CA: Jossey-Bass.

DeCuir-Gunby,J.T. (2008). Mixed Methods Research in the Social Science. In J.W. Osbourne (Ed.), *Best Practices in Quantitative Methods* (PP.125-136). Thousand Oaks, California: Sage.

deHaan, J. (2005). Learning language through video games: A theoretical framework, an analysis of game genres and questions for future research. In S. Schaffer & M. Price (Eds.), *Interactive Convergence: Critical Issues in Multimedia* (vol. 10) (pp. 229-239). Retrieved from http://www.inter-disciplinary.net/publishing/idp/eBooks/icindex.htm on November 12, 2012

deHaan, J. (2011). Teaching and learning English through digital game projects. *Digital Culture & Education*, *3*(1), 46-55.

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.

Dekanter, N. (2004). Gaming redefines interactivity for learning. *TechTrends, 49,* 26-31.

Dempsey, J. V., Haynes, L. L., Lucassen, B. A., & Casey, M. S. (2002). Forty simple computer games and what they could mean to educators. *Simulation & Gaming, 33*(2), 157-168. Dempsey

Deng, L. J., & Hu, H. P. (2007). Vocabulary acquisition in multimedia environment. *US-China Foreign Language, 5*(8), 55-59.

Denis, G. & Jouvelot, P. (2005*). Motivation-Driven Educational Game Design: Applying Best Practices to Music Education.* Paper presented at the 2005 ACM SIGCHI international conference on advances in computer entertainment technology. Valencia, Spain.

Derakhshan, A., & Khatir, E. D. (2015). The Effects of Using Games on English Vocabulary Learning. *Journal of Applied Linguistics and Language Research, 2*(3), 39-47.

Derwing, T. M., Munro, M. J., & Thomson, R. I. (2008). A longitudinal study of ESL learners' fluency and comprehensibility development. *Applied Linguistics, 29*(3), 359–380.

Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011). *Gamification: Using game-design elements in nongaming contexts*. Canada: ACM Press

Dewey, J. (1953). *The school and society* (Revised edition ed.). Chicago:

Dewey, J. (1986). Experience and education. *The Educational Forum, 50*(3), 241-252.

Diamond, L., & Gutlohn,L. (2006). *Second Language Vocabulary Acquisitions.* UK: University Press.

Dickey, M. D. (2006). Girl gamers: The controversy of girl games and the relevance of female-oriented game design for instructional design. *British Journal of Educational Technology, 37*(5), 785.

Dipboye, R. L., & Flanagan, M. F. (1979). Research settings in industrial and organizational psychology: Are findings in the field more generalizable than in the laboratory? *American Psychologist, 34*(2), 141-150.

Dondlinger, M. J. (2007). Educational video game design: A review of the literature. *Journal of Applied Educational Technology, 4*(1).

Donmus, V. (2010). The Use of Social Networks in Educational Computer-Game Based Foreign Language Learning. *Procedia - Social and Behavioral Sciences, 9,* 1497-1503.

Dörnyei, Z. (2001). *Teaching and Researching Motivation.* Harlow: Longman.

Dornyei, Z. (2007). *Research methods in applied linguistics.* New York: Oxford University

Press.

Dourda, K., Bratitsis, T., Griva, E., & Papadopoulou, P. (2014). Content and language integrated learning through an online game in primary school: a case study. *Electronic Journal of e-Learning, 12*(3), 243-258.

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., Japel, C. (2007). School readiness and later achievement. *Developmental Psychology, 43,* 1428–1446.

Dweik, B. (1986). *Research Paper in Applied Linguistics*. Hebron, Hebron University.

Easterbrook, R. M. (2013). *The process of vocabulary learning: Vocabulary learning strategies and beliefs about language and language learning* (PhD Thesis). The University of Canberra, Australia.

Ebrahimzadeh, M., & Alavi, S. (2017). Readers, Players, and Watchers: Short and Long-term Vocabulary Retention through Digital Video Games. *International Journal of Applied Linguistics & English Literature, 6*(4), 52-62.

Efendi, E. (2013). The Use of Games to Improve Vocabulary Mastery. *JP3, 1*(12), 78- 84.

Egenfeldt-Nielsen, S. (2006). Overview of research on the educational use of video games. *Nordic Journal of Digital Literacy, 3*(1),

Egenfeldt-Nielsen, S., Smith, J. H., & Tosca, S. P. (2013). *Understanding video games: The essential introduction* (2. ed.). New York: Routledge.

Elahe, E. F., & Alireza, V. (2018). The Effect of Problem-Based Learning on Iranian EFL Learners' Vocabulary Learning. *The Journal of Asia TEFL*, *15*(1), 208–216. https://doi.org/10.18823/asiatefl.2018.15.1.15.208

Elbaum, B. E., Berg, C. A., & Dodd, D. H. (1993). Previous learning experience, strategy beliefs, and task definition in self-regulated foreign language learning. *Contemporary Educational Psychology, 18,* 318–336.

Ellis, G., & Brewster, J. (1991), *The Storytelling Handbook for Primary Teachers,* Penguin

Ellis, H., Kirriemuir, J., Krotoski, A., McFarlane, A., & Heppell, S. (2006). *Unlimited Learning: Computer and Video Games in the Learning Landscape.* London: Entertainment and Leisure Software Publishers Association. Retrieved from https://www.researchgate.net/publication/316856674_Unlimited_learning_computer_ and_video_games_in_the_learning_landscape.

Ellis, N. (1994). Introduction: implicit and explicit language learning – an overview. In N. Ellis (Ed.), *Implicit and explicit learning of languages* (pp. 1-31). London etc.: Academic Press.

Ellis, R. (1994). *The study of second language acquisition.* Oxford: Oxford University Press.

Ellis, R. (2003). *The Study of Second Language Acquisition.* Oxford: Oxford University Press.

Engeström, Y. (1996). Developmental Studies of Work as a Testbench of Activity Theory: the Case of Primary Care Medical Practice. In S. Chaiklin, & J. Lave (Eds.) *Understanding Practice: Perspectives on Activity and Context*. Cambridge University Press.

Engeström, Y. (2001) Expansive Learning at Work: Toward an activity theoretical reconceptualization. *Journal of Education and Work, 14*(1), 133-156

Entertainment Software Association (ESA) (2007). *2007 Sales, demographic and usage data. Essential facts about the computer and video game industry.*

Entertainment Software Association (ESA) (2008). *Essential facts about the computer and video game industry: sales, demographic and usage data.*

Entertainment Software Association (ESA) (2009). *Essential facts about the computer and video game industry, E3 expo.*

Entertainment Software Association (ESA) (2015). *The 2015 Essential Facts about the Computer and Video Game Industry.* Washington, DC.

Entertainment Software Association (ESA) (2018). *The 2018 Essential Facts about the Computer and Video Game Industry.*

Erkkilä, M. (2017). *Learning English from digital games: Finnish upper secondary school students' perspective on game-enhanced language learning* (Master's thesis). University of Jyväskylä, Finland.

Ertmer, P. A. (2005). Teacher pedagogical beliefs: the final frontier in our quest for technology integration? *Educational Technology, Research and Development, 53*(4), 25–39.

Ertmer, P., & Newby, T. (2013). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from an Instructional Design Perspective. *Performance improvement quarterly, 26*(2), 43–71.

Fadel, C., & Lemke, C. (2008). *Multimodal Learning through Media: What the Research Says.* White paper.

Fan, M. (2003). Frequency of Use, Perceived Usefulness and Actual Usefulness of Second Language Vocabulary Strategies: A study of Hong Kong learners. *The Modern Language Journal, 87*(2), 222-241.

Faraj, A. K. A. (2015). Effective Strategies for Turning Receptive Vocabulary into Productive Vocabulary in EFL Context. *Journal of Education and Practice*, *6*(27), 10–19. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1077387&site=ehost-live

Farjami, F., & Aidinlou, A. N. (2013). Analysis of the Impediments to English Vocabulary Learning and Teaching. *International Journal of Language and Linguistics, 1*, 1-4. Retreived from: http://www.sciencepublishinggroup.com/j/ijll

Fatt, J.P.T., (2000), Understanding the learning styles of students: implications for educators. *International Journal of Sociology and Social Policy, 20,* 31-45.

Fennell, M. J. (2007). *Contradictions in the construction of the 'teacher-self': A case study of secondary English Language Teachers in a Majority world context* (doctoral dissertation). University of London, London.

Fennell, M. J. (2009). *Letter from Palestine: English shaped by occupation.* From Defining EIL Competence to Developing EIL Learning (2011), 170.

Ferguson, C. J., Cruz, A. M., & Rueda, S. M. (2008). Gender, video game playing habits, and visual memory tasks. *Sex Roles: A Journal of Research, 58,* 279-286

Fishkin, O. (2010). Effective primary literacy strategies for English language learners. *Illinois Reading Council Journal, 38*(4), 14-19. Retrieved from http://search.ebscohost.com.

Flatla, D., Gutwin, C., Nacke, L., Bateman, S., & Mandryk, R. (2011). *Calibration games: Making calibration tasks enjoyable by adding motivating game elements.* In UIST '11: Proceedings of the 24th annual ACM symposium on User interface software and technology, Santa Barbara, California, USA, pp. 403–412.

Fleming, N. D., & Mills, C. (1992). Helping Students Understand How They Learn. *The Teaching Professor, 7(*4). Madison, Wisconsin, USA: Magma Publications.

Fletcher, P., & German, M. (1986). *Language Acquisition: Studies in First Language Development.* England: Cambridge University Press.

Fogg, B. J. (2002). *Persuasive technology: Using computers to change what we think and do*. San Francisco: Morgan Kaufmann Publishers.

Folse, K. (2008). Teaching vocabulary is not the writing teacher's job. In J. Reid (Ed.), *Writing myths: Applying second language research to classroom teaching* (pp. 1-17). Ann Arbor, MI: University of Michigan Press.

Fraenkel, J., & Wallen, N. (2009). *How to design and evaluate research in education (7th ed.)*. New York, NY: McGraw-Hill Higher Education.

Franciosi, S. J. (2017). The Effect of Computer Game-Based Learning on FL Vocabulary Transferability. *Educational Technology & Society, 20*(1), 123–133.

Fu, F.L., Su, R.C., & Yu, S.C. (2008). EGameFlow**:** A scale to measure learners' enjoyment of e-learning games. *Science Direct E-Journals, 52*(1), 101-112.

Gachkova, M., & Somova, E. (2016). *Game-Based Approach in E-Learning*. University of Plovdiv "Paisii Hilendarski", 143-152.

Gallo-Crail, R., & Zerwekh, R. (2002). Language learning and the Internet: Student strategies in vocabulary acquisition. In C. A. Spreen (Ed.), *New technologies and language learning: Cases in the less commonly taught languages* (pp. 55−79). Honolulu, HI: University of Hawaiʻi, Second Language Teaching & Curriculum Center.

Garzotto, F. (2007). *Investigating the educational effectiveness of multiplayer online games for children.* Paper presented at the Interaction Design and Children (IDC 2007), Aalborg, Denmark.

Gass, S., & Selinker, L. (2001). *Second Language Acquisition: An Introductory Course (2nd ed.).* Mahwah, NJ: Lawrence Erlbaum.

Gee, J. P. (2003). *What video games have to teach us about learning and literacy.* New York (N.Y.): Palgrave Macmillan.

Gee, J. P. (2005). *Why video games are good for your soul: Pleasure and learning.* Melbourne: Common Ground.

Gee, J. P. (2007). *Good video games + Good leaning: Collected essays on video games, learning and literacy.*

Gee, J. P. (2008). *Learning and Games. The Ecology of Games: Connecting Youth, Games, and Learning.* In K. Salen, D. John, & T. Catherine. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: The MIT Press.

Gee, J. P. (2013). *Good video games and good learning: Collected essays on video games, learning and literacy* (2nd ed.). New York: Peter Lang.

Gee, J. P., & Hayes, E. (2011). *Language and learning in the digital age.* London: Routledge.

Gentile, D. A., Gentile, J. R. (2005). *Violent games as exemplary teachers.* In Paper presented at the biennial meeting of the society for research in child development. Atlanta, GA

Ghanbaran, S., & Ketabi, S. (2014). Multimedia games and vocabulary learning. *Theory and Practice in Language Studies, 4*(3), 489-496.

Ghazal, R. (2012). *The growth and development of the child from 6 to 12 years old.* Retrieved from https://childclinic.net/%D9%86%D9%85%D9%88-%D9%88%D8%AA%D8%B7%D9%88%D8%B1-%D8%A7%D9%84%D8%B7%D9%81%D9%84-%D9%85%D9%86-%D8%B9%D9%85%D8%B1-6-%D8%A5%D9%84%D9%89-12-%D8%B3%D9%86%D8%A9/

Ginsburgh, V. A., & Prieto-Rodríguez, J. (2011). Returns to foreign languages of native workers in the EU. *Industrial and Labor Relations Review*, *64*(3), 599–618. https://doi.org/10.1177/001979391106400309

Gleitman, H. (1995). *Psychology (4th ed.).* New York: Norton.

Godwin-Jones, R. (2005). Messaging, gaming, peer-to-peer sharing: Language learning strategies and tools for the millennial generation. *Language Learning & Technology, 9*(1), 17-22. Retrieved from http://llt.msu.edu/vol9num1/emerging/default.html

González, C., & Izquierdo, F. (2012). Designing social videogames for educational uses. *Comput. Educ. 58*(1), 250-262. DOI=10.1016/j.compedu.2011.08.014. Retrieved from: http://dx.doi.org/10.1016/j.compedu.2011.08.014

Goulden, R., Nation, P., & Read, J. (1990). How large can a receptive vocabulary be? *Applied Linguistics, 11.* https://doi.org/10.1093/applin/11.4.341.

Grabe, W., & Stoller, F.L. (1997). Reading and vocabulary development in a second language: a case study. In Coady, J. &Huckin, T. (Eds.), *Second Language Vocabulary Acquisition* (p. 98-122). UK: Cambridge University Press.

Gray, K. (2012). *Race, Gender, and Deviance in X-Box Live.* New York: Routledge.

Griffiths, M. (2002). The Educational Benefits of Videogames. *Education and Health, 20* (3), 47-52.

Griffiths, M. D. (1996). Computer game playing in children and adolescents: A review of the literature. In T. Gill (Ed.), *Electronic children: How children are responding to the information revolution* (pp. 41–58). London: National Children's Bureau.

Griffiths, M., & Hunt, N. (1995). Game playing in adolescence: Prevalence and demographic indicators. *Journal of Community and Applied Psychology, 5,* 189–193.

Griffiths, M.D. (1999). Internet addiction: Fact or fiction? *Psychologist, 12*(5), 246-250.

Gros, B. (2007). Digital Games in Education: The Design of Game-based Learning Environments. *Journal of Research on Technology in Education, 40,* 23–38.

Gruss, J. (2016). Games as a tool for teaching English vocabulary to young learners. *World Scientific News, 53* (2), 67-109.

Gu, Y. (2003). Vocabulary Learning in Second Language: Person, Task, Context and Strategies. *Electronic Journal. TESL-EJ, 7,* 2, 1-26.

Gu, Y. (2011). Learning Strategies for Vocabulary Development. *Reflections on English Language Teaching, 9*(2), 105–118.

Gu, Y., & Johnson, R. K. (1996). Vocabulary Learning Strategies and Language Learning Outcomes. *Language Learning, 46,* 643-679. http://dx.doi.org/10.1111/j.1467-1770.1996.tb01355.x

Hadfield, J. (1998). *Elementary Vocabulary Games- A collection of vocabulary games and activities for elementary students of English*. Longman.

Hall, J. K., & Verplaetse, L. S. (Eds.) (2000). *Second and Foreign Language Learning through Classroom Interaction.* Mahvah, NJ: Lawrence Erlbaum.

Hamari, J., & Nousiainen, T. (2015). *Why Do Teachers Use Game-Based Learning Technologies? The Role of Individual and Institutional ICT Readiness.* Proceedings of the Annual Hawaii International Conference on System Sciences, 2015–March, 682–691. https://doi.org/10.1109/HICSS.2015.88

Hammad, E. (2014). Palestinian EFL Teachers' Attitudes Towards English Textbooks Used at the First Three Grades of Elementary School. *Tesl-Ej, 18*(1), 1–18.

Hanghøj, T. (2011). Clashing and Emerging Genres: The interplay of knowledge forms in

educational gaming. *Designs for Learning*, *4*(1), 22–33.

Hanson, S., & Padua, J. F. (2011). *Teaching Vocabulary Explicitly*. New York: Pacific Resources for Education and Learning.

Harb, A. (2007). *The Effectiveness of Educational Games on the Sixth Graders Achievement in English Language in Gaza Southern Governorate* (Master Thesis). The Islamic University, Gaza.

Harmer, J. (1991). *The practice of English language teaching*. London: Longman.

Harmer, J. (2001). *The practice of English language teaching. London*: Longman. Hellay

Harmer, J. (2010). *How to teach English.* Harlow: Longman.

Hartmann, T., & Klimmt, C. (2006). Gender and Computer Games: Exploring Females' Dislikes. *Journal of Computer-Mediated Communication 11*(4), 910-931. https://doi.org/10.1111/j.1083-6101.2006.00301.x

Hashemi, Z., & Hadavi, M. (2015). Investigation of Vocabulary Learning Strategies among EFL Iranian Medical Sciences Students. *Procedia - Social and Behavioral Sciences*, *192*, 629–637.

Hatch, E., & Brown, C. (1995). *Vocabulary, Semantics, and Language Education.* Cambridge: Cambridge University Press.

Hayes, E. (2005). Women, video gaming and learning: Beyond stereotypes. *TechTrends: Linking Research & Practice to Improve Learning, 49*(5), 23.

Hazlett, T. (2004). Requiem for the V-Chip. *Slate*. Retrieved from http://www.slate.com/articles/arts/

He, Y. (2010). A Study of L2 Vocabulary Learning Strategies. *The School of Teacher Education English, 4*, 40.

Hedge, T. (2000). *Teaching and learning in the language classroom.* Oxford: Oxford University Press.

Helsper, E., & Eynon, R. (2010). Digital natives: Where is the evidence?. *British Educational Research Journal, 36,* 503-520.

Henriksen, B. (1999). Three Dimensions of Vocabulary Development. *Studies in Second Language Acquisition, 21*(2), 303-317.

Henriksen, B., & Haastrup, K. (2000). *The interrelationship between vocabulary acquisition theory and general SLA theory*. Paper presented at EUROSLA 10, September 2000, Poland.

Henry, A. (2013). Digital games and ELT: Bridging the authenticity gap. In E. Ushioda (Ed.). *International perspectives on motivation: Language learning and professional challenges (*pp. 133-155). Houndmills: Palgrave Macmillan

Heppell, S., Ellis, H., Heppell, S., Kirriemuir, J., Krotoski, A., & McFarlane, A. (2006).

Unlimited learning: Computer and video games in the learning landscape. London: Entertainment and Leisure Software Publishers Association.

Hirsch, E. D. (2003). *Reading comprehension requires knowledge – of words and the world: Scientific insights into the fourth grade slump and the nation's stagnant comprehension scores.* American Educator, American Federation of Teachers.

Hirumi, A., & Stapleton, C. (2008). Applying pedagogy during game development to enhance game-based learning. In C. T. Miller (Ed.), *Games: Purpose and potential in education* (pp. 127-162). USA: Springer.

Hismanoglu, M. (2000). Language Learning Strategies in Foreign Language Learning and Teaching. *The Internet TESL Journal*, 5 (8). Retrieved from http://iteslj.org/Articles/Hismanoglu-Strategies.html.

Hitosugi C. I., Schmidt, M., & Hayashi, K. (2014). Digital game-based learning (DGBL) in the L2 classroom: The impact of the UN's off-the-shelf videogame, Food Force, on learner affect and vocabulary retention. *CALICO Journal, 31*(1).

Holden, C., & Sykes, J. (2011). Leveraging mobile games for place-based language learning. *International Journal of Game-based Learning, 1*(2), 1–18.

Holsapple, C. W., & Wu, J. (2008a). In Search of a Missing Link. *Knowledge Management Research and Practice, 6*(1), 31–41. http://dx.doi.org/10.1057/palgrave.kmrp.8500170

Holsapple, C. W., & Wu, J. (2008b). Building effective online game websites with knowledge-based trust. *Information Systems Frontiers, 10*, 47–60

Hoogeveen, M. (1995). Toward a new multimedia paradigm: Is multimedia assisted instruction really effective? *System, 28,* 113-115.

Hornby (1995). *Vocabulary Learning for Young Learners.* National Centre for English Language Teaching and Research, Macquarie University.

Hornby (1997). *Vocabulary and Language Education*. New York: Cambridge University Press

Horwitz, E. K. (1988). The Beliefs about Language Learning of Beginning University Foreign Language Students. *The Modern Language Journal, 72(3), 283–294.* doi:10.1111/j.1540-4781.1988.tb04190.

House, S. (1997). *Teaching English to children*. London: Richmond Publishing.

Howe, N., & Strauss, W. (2000). *Millennials rising: The next great generation.* NY: Vintage Books.

Howe, N., & Strauss, W. (2003). *Millennials Go to College.* American Association of Collegiate Registrars and Admissions Officers and LifeCourse Associates.

Hsu, H. Y., & Wang, S. K. (2010). Using gaming literacies to cultivate new literacies. *Simulation & Gaming, 41*(3), 400–417.

Huang, B. G., & Yang, J. C. (2012). *A multiplayer online role-playing game for incidental vocabulary learning*. Proceedings of the 20th International Conference on Computers in Education. Retrieved from http://www.lsl.nie.edu.sg/icce2012/wp-content/uploads/2012/12/C6-f-194.pdf

Hubbard, P. (1991). Evaluating computer games for language learning. *Simulation & Gaming*, *22*(2), 220-223.

Huckin, T., & Coady, J. (1999). Incidental vocabulary acquisition in a second language: A review. *Studies of Second Language Acquisition, 21*, 181-193.

Hulstijn, J. H. (1992). Retention of Inferred and Given Word Meanings: Experiments in Incidental Learning. In P. J. L. Arnaud and H. Bejoint (Eds.), *vocabulary and applied linguistics* (pp. 113-120). Hondon: Macmillian.

Hulstijn, J. H. (2001). Intentional and Incidental Second Language Vocabulary Learning: A Reappraisal of Elaboration, Rehearsal and Automaticity. In Robinson, P. (Ed.), *Cognition and second language instruction* (pp. 258-287). Cambridge: C.U.P.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). *MDA: A Formal Approach to Game Design and Game Research*. In Proceedings of the Challenges in Game AI Workshop, Nineteenth National Conference on Artificial Intelligence.

Hunt, A., & Beglar, D. (1998). Current research and practice in teaching vocabulary. *The Language Teacher, 22*(1).

Huyen, N. T. T., & Nga, K. T. T. (2003). Learning Vocabulary through Games: The Effectiveness of Learning Vocabulary Through Games. *Asian EFL Journal*. http:/www.asian-efljournal.com/ dec-03-sub.Vn.php.

Hwang, G., Wu, P., & Chen, C. (2012). An Online Game Approach for Improving Students' Learning Performance in Web-Based Problem-Solving Activities. *Computer & Education, 59*(4), 1246-1256.

Intaraprasert, C. (2004). *ETS Students and Vocabulary Learning Strategies: A Preliminary Investigation (*Unpublished Research). Suranaree University of Technology, Nakhon Ratchasima, Thailand.

Ito, M. (2009). *Engineering play: A cultural history of children's software*. Cambridge, MA: MIT Press.

Jackson, L. A., Witt, E. A., Games, A. I., Fitzgerald, H. E., Von Eye, A., & Zhao, Y. (2012). Information technology use and creativity: Findings from the Children and Technology Project. *Computers in Human Behavior, 28*(2), 370–376.

Japan Exchange and Teaching (JET) Programme participants (2013). *The 2013 Japan Exchange and Teaching (Jet) Programme Application Guidelines.*

Jayalath, J., & Esichaikul, V. (2015). *Gamification-embedded E-Learning Courses for the Learner Success of Competency Based Education: Case of Technical and Vocational*

Education and Training. Presented in 8th Pan-Commonwealth Forum on Open Learning (PCF8) 27 - 30 November 2016. *Oasis. Retrieved from* http://oasis.col.org/

Jdetawy, L. (2011). Problems Encountered by Arab EFL Learners. *Language in India, 11.*

Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics, 21,* 47–77.

Johnson, W. L., Marsella, S., Mote, N.,Viljhalmsson, H., Narayanan, S., & Choi, S. (2004). *Tactical Language Training System: Supporting The Rapid Acquisition of Foreign Language and Cultural Skills.* Proceedings of InSTIL/ICALL 2004 – NLP and Speech Technologies in Advanced Language Learning Systems – Venice 17-19 June, 2004.

Joklová, K. (2009). *Using Pictures in Teaching Vocabulary* (Bachelor's thesis). Masaryk University.

Jonassen, D. H. (1991). Evaluating constructivist learning. *Educational Technology, 31,* 28-33.

Jonassen, D. H. (1996*). Computers in the classroom: Mindtools for critical thinking.* Englewood Cliffs, New Jersey: Prentice-Hall.

Jones, C., & Shao, B. (2011). *The net generation and digital natives: Implications for Higher Education.* York: Higher Education Academy.

Jones, M. G. (1998). Creating Engagement in Computer-Based Learning Environments, *ITForum.*

Jones, R. (2005). What do children most enjoy about summer soccer camp? Gender and group perceptions. *Physical Educator, 62*(1), 2.

Jong, B., Lai, Ch., Hsia, Y., Lin, T., & Lu, Ch. (2013). Using Game-Based Cooperative Learning to Improve Learning Motivation: A Study of Online Game Use in an Operating Systems Course. *IEEE Transactions on Education, 56* (2), 183-190.

Jorgensen, B. (2003). Baby Boomers, Generation X and Generation Y?: Policy implications for defense forces in the modern era, *Foresight, 5*(4), 41-49.

Judge, S. (2005). The Impact of Computer Technology on Academic Achievement of Young African American Children. *Journal of Research in Childhood*, *20*(2), 91.

Juul, J. (2011). *Half-Real: Video Games between Real Rules and Fictional Worlds.* Cambridge (MA): The MIT Press.

Kahila, J., & Saarikoski, O. (2014). *Lasten kokemuksia digitaalisista peleistä oppimisesta.*

Kahraman, C., & Zengin, B. (2014). Facilitation potential of the mnemonics for the teaching of Japanese vocabulary to Turkish speaker. *Humanitas, International Journal of Social Sciences, 2*(4), 165-182.

Kalyuga, M., Mantai, L., & Marrone. M. (2013). Efficient Vocabulary Learning Through Online Activities. *Procedia - Social and Behavioral Sciences, 83,* 35-38

Kamil, M.L. & Hiebert, E.H. (2007). *A Focus on Vocabulary*. Retrieved from http:/www.prel.org/products/re_/ES0419.htm accessed in July 19, 2007

Kamil, M.L., and E.H. Hiebert. (2005). Teaching and learning vocabulary: Perspectives and persistent issues. In E.H. Hiebert and M.L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice.* Mahwah, NJ: Erlbaum.

Kangas, M. (2010). Creative and Playful Learning: Learning through Game Co-Creation and Games in a Playful Learning Environment. *Thinking Skills and Creativity, 5* (1), 1-15.

Kaplan, R., & Saccuzzo, D. (2013). *Psychological testing: Principles, applications, & issues.* Wadsworth, Cengage Learning.

Kappers, W. M. (2017). STEM, Video Game Play, & Gender = Personalization. *Academic Exchange Quarterly (AEQ), 21*(2), 140.

Karasavvidis, I. (2009). Activity Theory as a Conceptual Framework for Understanding Teacher Approaches to Information and Communication Technologies. *Computer and Education, 53,* 436 – 444.

Kennedy, G. (2003). Amplifier collocations in the British National Corpus: Implications for English language teaching. *Tesol Quarterly*, *37*(3), 467-487.

Kennewell, S., & Beauchamp, G. (2003). The influence of a technology-rich classroom environment on elementary teachers' pedagogy and children's learning. In J. Wright, A. McDougall, J. Murnane, & J. Lowe (Eds.), *Young children and learning technologies* (pp. 65-70). Sydney: Australian Computer Society.

Kennewell, S., Tanner, H. & Parkinson, J. (2000). *Developing the ICT capable school.* London: Routledge Falmer.

Kent, R. C. (2004). International humanitarian crises: two decades before and two decades beyond. *International Affairs, 80(5), 851–869.*doi:10.1111/j.1468-2346.2004.00422.x

Kerka, S. (2000). *Incidental Learning. Trends and Issues Alert (No. 18*). New York, NY: Peter Lang.

Keshta, A. S. (2000). *Alternative Approaches for Teaching English Literature to Understand Students in Gaza Strip*. University of Houston, Houston.

Keshta, A., & Al-Faleet, F. (2013). The Effectiveness of Using Puzzle in Developing Palestinian Tenth Graders vocabulary achievement and retention. *Humanities and Social Sciences*, *1*(1), 46-57. doi: 10.11648/j.hss.20130101.16. Retrieved from http://scienceublishinggroup.com/j/hss

Khaldi, M., & Wahbeh, N. (2002). *The role of the supervisory system: realties and needs (*unpublished paper.' Ramallah, Palestine: QCERD.

Kilickaya, F., & Krajka, J. (2010). Comparative usefulness of online and traditional vocabulary learning. *The Turkish Online Journal of Educational Technology, 9*(2), 55-63.

Kim, B., Park, H., & Baek, Y. (2009). Not just fun, but serious strategies: Using meta-cognitive strategies in game-based learning. *Computers & Education*, *52*(4), 800-810.

Kim, K. (2015). Using the MMORPG 'RuneScape' to Engage Korean EFL (English as a Foreign Language), Young Learners in Learning Vocabulary and Reading Skills (PhD Dissertation).

Kim, P., Kim, S., Shim, M., Im, Ch., & Shon,Y. (2013). The Influence of an Educational Course on Language Expression and Treatment of Gaming Addiction for Massive Multiplayer Online Role-Playing Game (MMORPG) Players. *Computers & Education, 63,* 208-2017.

Kim, T. Y. (2011). Korean elementary school students' English learning demotivation: a comparative survey study. *Asia Pacific Education Review, 12*, 1-11.

Kirriemuir, J. (2003). The relevance of video games and gaming consoles to the higher and further education learning experience. *JISC*, *3*(1). (Techwatch Report, TSW 2002).

Kirriemuir, J., & Mcfarlane, A. (2004). Literature review in games and learning, *NESTA futurelab research report*. Retrieved from https://telearn.archives-ouvertes.fr/hal-00190453/document

Klawe, M. M. (1994). *The educational potential of electronic games and the E-GEMS Project*. In T. Ottman, & I. Tomek (eds), Proceedings of the ED-MEDIA 94 World Conference on Educational Multimedia and Hypermedia. Panel discussion 'Can electronic games make a positive contribution to the learning of mathematics and science in the intermediate classroom?' AACE (Association for the Advancement of Computing in Education), Vancouver, Canada, 25–30 June 1994.

Klimovaa, F. B. (2015). Games in the Teaching of English. *Procedia - Social and Behavioral Sciences, 191,* 1157–1160.

Kohat, D. (2012). Strength for Today and Bright Hope for Tomorrow. 277–287. https://doi.org/10.3115/1708141.1708143

Kongmee, I., Strachan, R., Montgomery, C., & Pickard, A. (2011). *Using massively mul tiplayer online role playing games (MMORPGs) to support second language learning: Action research in the real and virtual world.* In the 2nd Annual IVERG Conference: Immersive Technologies for Learning: Virtual Implementation, Real Outcomes, (June), 27–28. https://doi.org/10.1007/s12063-015-0100-x

Korthagen, F. A. J. (2007). The Gap between Research and Practice Revisited. *Educational Research and Evaluation, 13*(3), 303 – 310.

Kose, T., Cimen, E., & Mede, E. (2016). Perceptions of EFL Learners about Using an Online Tools for Vocabulary Learning in EFL Classroom: A pilot Project in Turkey. *Procedia - Social and Behavioral Sciences, 232,* 362 – 372. doi: 10.1016/j.sbspro.2016.10.051. Retrieved from www.sciencedirect.com.

Kothari, C. R. (2004). *Research Methodology: Methods and Techniques.* New Age International (P) Ltd: Daryaganj, New Delhi.

Kouhail, H. (2004). *Vocational Technical Education and Training in Palestine* – Proposal for a National Strategy. Ramallah: Ministry of Education.

Kovanen, M. (2014). *Vocabulary learning strategies employed by Finnish high school EFL students* [online]. University of Jyväskylä, Department of languages. Retrieved from https://jyx.jyu.fi/bitstream/handle/123456789/43319/URN%3aNBN%3afi%3ajyu201405061622.pdf?sequence=1&isAllowed=y

Krashen, S. D. (1982). *Principles and practices in second language acquisition.* Oxford: Pergamon.

Krashen, S. D. (1985). *The Input Hypothesis: Issues and implications.* London: Longman.

Kulik, J. A. (1994). Meta-analytic studies of findings on computer-based instruction. In E. L. Baker, & F, O'N. & Jr, Harold (Eds.), *Technology assessment in education training (*pp. 9-34)*.* Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Kulikova, O. (2015). Vocabulary learning strategies and beliefs about vocabulary learning: A study of beginning university students of Russian in the United States (PhD thesis). University of Iowa, Iowa.

Kvale, S. (1996). *Interview Views: An Introduction to Qualitative Research Interviewing.* Thousand Oaks, CA: Sage Publications.

Lacasa, P., Martinez, R., & Mendez, L. (2008). Developing New Literacies Using Commercial Videogames as Educational Tools. *Linguistics and Education: An International Research Journal, 19*(2), 85-106.

Lai, Y. L. (2005). *Teaching Vocabulary Learning Strategies: A Survey of Awareness, Beliefs, and Practices.* Taiwanese EFL Senior High School Teachers (Master's thesis). University of Essex.

Lam, S. L. (2013). *Use of gamification in vocabulary learning: A case study in Macau.* Centre for English Language Communication (CELC) Symposium, Singapore.

Lamb, M. (2004). It depends on the students themselves: Independent language learning at an Indonesian state school. *Language, Culture and Curriculum, 17(3*), 229–245.

Langer, J. (1967). Better abstract vocabulary – higher intelligence quotient? *The Elementary School Journal, 68,* 157–161

Lankshear, C., & Knobel, M. (Eds.) (2008). *Digital literacies: Concepts, policies and practices.* Bern & Frankfurt: Peter Lang.

Larsson, T. (2014). *Vocabulary learning Title: Vocabulary learning: A study of students' and teachers' attitudes towards English vocabulary learning in lower secondary school.*

Laskaris, J. (2014). *30 facts about gamification in e-learning.* Retrieved from eLearning Industry http://elearningindustry.com/30-facts-gamification-in-elearning

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In C. Lauren & M. Nordman (Eds.), *Special language: From humans to thinking machines* (pp. 316–323). Clevedon, England: Multilingual Matters.

Laufer, B. (1992). How much lexis is necessary for reading comprehension? In P. J. L. Arnaud & H. B´ejoint (Eds.), *Vocabulary and applied linguistics* (pp. 126–132). London: Macmillan.

Laufer, B. (1997). The lexical plight in second language learning: Words you don't know, words you think you know and words you can't guess. In J. Coady & T. Huckin (Eds.), *Second language vocabulary acquisition: A rationale for pedagogy* (pp. 20-34). New York: Cambridge University Press.

Laufer, B. (1997). What's in Word that Makes it Hard or Easy: Some Internal Factors that Affect the Learning of Words. In Schmitt & MacCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 140-155). UK: Cambridge University Press.

Laufer, B. (2000). *Task effect on instructed vocabulary learning: The hypo thesis of "involvement".* Selected papers from AILA '99 Tokyo (pp. 47–62). Tokyo: Waseda University Press.

Laufer, B., & Girsai, N. (2008). Form-focused Instruction in Second Language Vocabulary Learning: A Case for Contrastive Analysis and Translation, *Applied Linguistics*, *29* (4), 1, 694–716, https://doi.org/10.1093/applin/amn018

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied linguistics*, *22*(1), 1-26.

Laufer, B., & Nation, P. (1999). A Vocabulary-Size Test of Controlled Productive Ability. *Language Testing, 16,* 33-51.

Laufer, B., & Nation,P. (2012). Vocabulary. In S. M. Gass, & A. Mackey (Eds.), *The Routledge handbook of second language acquisition* (pp. 163-176). London: Routledge.

Laufer, B., & Sim, D. D. (1985). Taking the easy way out: Non-use and misuse of contextual clues in EFL reading comprehension. *English Teaching Forum, 23,* 7–10.

Leathem, T., & Tatum, M. (2012). *Games as an interactive learning tool: a case study of a jeopardy style game show for construction classes.* Paper presented in 48th ASC Annual International Conference Proceedings, Birmingham, UK.

Lee, J., & Hammer, J. (2011). Gamification in Education: What, How, Why Bother? Gamification in Education: What, How, Why Bother? *Academic Exchange Quarterly*, *15*(2). Retrieved from https://www.researchgate.net/publication/258697764_Gamification_in_Education_What_How_Why_Bother

Leedy, P. D. (1993). *Practical research: planning and design.* New Jersey: Prentice-Hall.

Leont'ey, A.N. (1978). *Activity, Consciousness, and Personality.* Translated from Russian by Marie J. Hall. Englewood Cliffs, NJ; London: Prentice-Hall. Retrieved from http://www.marxists.org/archive/leontev/works/1978/index.htm

Leppänen, S., Pitkänen-Huhta, A., Piirainen-Marsh, A., Nikula, T., & Peuronen, S. (2009). Young people's translocal new media uses: A multiperspective analysis of language choice and heteroglossia. *Journal of Computer-Mediated Communication, 14*(4), 10801107. http://doi.org/10.1111/j.1083-6101.2009.01482

Letchumanan, K., & Bee Hoon, T. (2012). Using computer games to improve secondary school students' vocabulary acquisition in English. *Social Sciences and Humanities, 20*(4), 1005-1018.

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

Li, R. C., & Topolewski, D. (2002). ZIP & TERRY: A new attempt at designing language learning simulation. *Simulation & Gaming Journal, 33*, 181-186.

Lightbown, P. M., & Spada. N. (2006). *How languages are learned (3rd ed.).* Oxford: Oxford University Press.

Lim, C. P., & Hang, D. (2003). An activity theory approach to research of ICT integration in Singapore schools. *Computers & Education, 41*(1), 49-63. Elsevier Ltd.

Lin, A. (2013). Classroom code-switching: Three decades of research. Applied Linguistics Review 4(1), 195-218.

Lin, Ch., Hsiao, H. Tseng, sh., & Chan, H. (2014). Learning English Vocabulary Collaboratively in a Technology-Supported Classroom. *TOJET: The Turkish Online Journal of Educational Technology, 13*(1), 162-173.

Lin, H. (2014). *Effectiveness of Interactivity in a Web-based Simulation Game on Foreign Language Vocabulary Learning*. Presented in 4th World Conference on Educational Technology Researches, WCETR 2014. *Procedia - Social and Behavioral Sciences, 182,* 313 – 317.

Linderoth, J., & Bennerstedt, U. (2007). *Att leva i World of Warcraft.* Stockholm: Medierådet, Regeringskansliet.

Lindh, S. (2009). *Online computer game English: A study on the language found in World of Warcraft*. Karlstad University, Karlstad. Retrieved from http://kau.diva-portal.org/smash/record.jsf?searchId=1&pid=diva2:221885.

Litwin, M. S. (1995). How to measure survey reliability and validity. *Sage,* 7.

Livingstone, D. W. (2001). *Adults' informal learning: Definitions, findings, gaps and future research*. Centre for the Study of Education and Work, OISE/UT.

Loon, J. V. (2008). *Media technology. Critical perspectives.* Maidenhead: Open University Press.

López-Jiménez, M. D. (2010). The treatment of lexical aspects in commercial textbooks for L2 teaching and learning. In Chacón-Beltrán et al. (eds.), *Further Insights into Non-native Vocabulary Teaching and Learning* (pp. 156-174). Clevedon, Multilingual Matters.

Lucas, K., & Sherry, J. L. (2004). Sex differences in video game play: A communication-based explanation. *Communication Research, 31*(5), 499-523.

Luján-García, C. (2012). The impact of English on Spanish daily life and some pedagogical implications. *NJES Nordic Journal of English Studies*, *11*(1), 1–21.

Ma, Q. (2009). *Second language vocabulary acquisition.* Bern: Peter Lang AG, International Academic Publishers.

Macaro, E., Handley, Z. L., & Walter, C. (2012). A systematic review of CALL in English as a second language: Focus on primary and secondary education. *Language Teaching*, *45*(01), 1-43.

MacIntyre, P. D., Baker, S. C., Cle´ment, R., & Conrod, S. (2001). Willingness to communicate, social support, and language-learning orientations of immersion students. *Studies on Second Language Acquisition, 23*, 369-388.

MacIntyre, P., Clement, R., Dornyei, Z., & Noels, K. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal, 82,* 545-562. [Online] Available: http://www.jstor.org/stable/330224

Manochehri, N., & Young, J. I. (2006). The Impact of Student Learning Styles with Web-based Learning or Instructor-based Learning on Student Knowledge and Satisfaction. *The Quarterly Review of Distance Education, 7*(3), 313-316.

Margoudi, M., Smyrnaiou, Z. (2015). An Educational Application of Online Games for Learning Difficulties. *International Scholarly and Scientific Research & Innovation*, *9*(7), 2336-2340.

Markopoulos, A., Dossis, M., Fragkou, A., & Kasidiaris, P. (2016). Gamifying e-learning as a Means of Overcoming Its Deficiencies. *SEEDA-CECNSM, 16,* 86-91.

Martin-Martin, J. (2013). Do Translation Students Learn Vocabulary When They Translate? *Atlantis*, *35*(2), 119–136.

Martin, C. (1996). Linguistic and communicative competence. In. N. McLaren, & D. Madrid (Eds.), *A Handbook for TEFL* (pp. 313-343).Alicante: Marfil.

Marton, F. (2006). Sameness and difference in transfer. *The Journal of the Learning Sciences, 15*(4), 501–538.

Marttinen, M. (2008). *Vocabulary Learning Strategies Used By Upper Secondary School Students Studying English As a Second Language.*

Mason, J. (2006). Mixing methods in a qualitatively driven way. *Qualitative Research, 6* (9),

9:25.

Mawer, K. and Stanley, G. (2011). *Digital Play. Computer games and language aims*. Peaslake: Delta Publishing.

Mayer, R. (2014). *Computer Games for Learning*. Cambridge: The MIT Press. MacMillan English Dictionary.

Mayer, R. E. (1997). Multimedia learning: Are we asking the right questions? *Educational psychologist, 32*(1), 1-19.

Mayer, R. E. (2001). *Multimedia Learning*. New York: Cambridge University Press.

Mayer, R. E. (2009). *Multimedia Learning*. New York: Cambridge University Press.

Mäyrä, F. (2008). *An Introduction to Game Studies: Games and culture.* London: SAGE Publications Ltd.

McWhorter, K. T. (1989). *College Reading and Study Skills*. Glenview Illinois Boston London: Niagara County Community College.

McCarthy, M. J. (1990). *Vocabulary*. Oxford: Oxford University Press

McCombs, B. L., & Whisler, J. S. (1997). *The learner-centered classroom and school: Strategies for increasing student motivation and achievement*. San Francisco: Jossey-Bass.

McLaren, N., & Madrid, D. (eds.) (1996). *A Handbook for TEFL*. Alicante: Marfil,

Means, B. (1994). Introduction: Using Technology to Advance Education Goals. In B. Means (eds.), *Technology and Education Reform: The Reality Behind the promise*. California: Jossey. Bass Inc.

Meara, P. (1984). The study of lexis in interlanguage. In A. Davies, C. Criper, & A. P. R. Howatt (Eds.), *Interlanguage* (pp. 225–235). Edinburgh: Edinburgh University Press.

Meara, P. (1995). Single subject studies of lexical acquisition. *Second Language Research, 11,* i-iii.

Meara, P. (1996). The dimensions of lexical competence. In Brown, G., Malmkjær, K., Williams, J. (eds.) *Performance and Competence in Second Language Acquisition* (pp. 35-52). Cambridge: Cambridge University Press.

Meara, P. (1997). Towards a new approach to modelling vocabulary acquisition. In Schmitt, N., & Mc Carthy, M. (eds.), *Vocabulary: Description, Acquisition and Pedagogy* (pp.109-121). Cambridge. Cambridge University Press,

Mifsud, C. L., Rosalind, V., & Liberato, C. (2013). Attitudes towards and effects of the use of video games in classroom learning with specific reference to literacy attainment. *Res. Educ., 90,* 32–52.

Mikki, M., & Jondi, N. (2010). eLearning in Palestine. In U. Demiray (Ed.), Cases on challenges facing e-learning and national development: Institutional studies and

practices (pp. 627–652). Eskisehir, Turkey: Anadolu University.

Miller, G. A. (1999). On knowing a word. *Annual Review of Psychology, 50*, 1–19.

Milton, J., (2009). *Measuring Second Language Vocabulary Acquisition*. Bristol, England: Multilingual Matters.

Ministry of Education (1999). *English Language Curriculum for the Basic Education Stage*. Prepared by the English Language Team, Palestine.

Ministry of Education and Higher Education (2011). *English for Palestine 3, Pupil's Book.* Palestine: Macmillan Publishers.

Ministry of Education and Higher Education (2014). *Education Development Strategic Plan EDSP 2014-2019: A Learning Nation.*

Ministry of Education and Higher Education (2018). *Education Statistical Yearbook for Scholastic year 2017 – 2018.* Ramallah- Palestine.

Ministry of Education and Higher Education Palestine (2008). *EDUCATION DEVELOPMENT STRATEGIC PLAN 2008-2012: Towards Quality Education for Development*.

Ministry of Education: General Administration of Curricula (2015). *English Language Curriculum for Public Schools Grades 1-12*.

Mitchell, A. (2003). *Exploring the potential of a games-oriented implementation for m-portal.* Paper presented at the MLEARN 2003 conference – learning with mobile devices. London.

Mitchell, A., & Savill-Smith, C. (2004). *The use of computer and video games for learning A review of the Literature Photo Redacted Due to Third Party Rights or Other Legal Issues Photo Redacted Due to Third Party Rights or Other Legal Issues*.

Moeller, A. J., & Catalano, T. (2015). Foreign Language Teaching and Learning. *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, 327–332. https://doi.org/10.1016/B978-0-08-097086-8.92082-8

Mondria, J. A., & Wiersma, B. (2004). Receptive, productive, and receptive and productive L2 vocabulary learning: What difference does it make? In P. Bogaards, & B. Laufer (Eds.), *Vocabulary in a second language: selection, acquisition, and testing* (pp. 79–100). Amsterdam: John Benjamins.

Monrad, M. (2013). On a scale of one to five, who are you? Mixed methods in identity research. *Acta Sociológica, 56*(4), 347–360.

Moran-Ellis, J., Alexander, V. D., Cronin, A., Dickinson, M., Fielding, J., Sleney, J., & Thomas, H. (2006). Triangulation and integration: processes, claims and implications. *Qualitative research, 6*(1), 45-59.

Morton, C. (1996). The Modern Land of Laputa. *Ph. Delta Kappan. 77*(6), 416 - 419.

Mou, Y. (2007). *Gender and racial stereotypes in popular video games (*Master's thesis). Michigan State University, United States.

Mukoroli, J. (2011). Effective Vocabulary Teaching Strategies for The English For Academic Purposes ESL Classroom. *MA TESOL Collection, Paper 501*, 53.

Mullamaa, K. (2014). ICT in Language Learning-Benefits and Methodological Implications. *International Education Studies*, *3*(1), 38–44. https://doi.org/10.5539/ies.v3n1p38

Muntean, C. I. (2011). *Raising engagement in e-learning through gamification.* Paper presented at the 6th International Conference on Virtual Learning ICVL 2012 (pp. 323–329).

Musleh, R. (2010). *Language Learning Motivation: The Palestinian Context Attitudes, Motivation, and Orientation.* Unpublished PhD thesis, university of Barcelona.

Nahmod, D. (2017). *Vocabulary gamification vs traditional learning instruction in an inclusive high school classroom*, (Master's thesis). Rowan University, United State.

Naimie, Z., Siraj, S., Abuzaid, R. A., & Shagoholi, R. (2010). Hypothesized Learners' Technology Preferences Based on Learning Style Dimensions. *The Turkish Online Journal of Educational Technology, 9*(4), 83-93.

Nardi, B. A. (Ed.) (1996). *Context and Consciousness: activity theory and human-computer interaction*. Cambridge: The MIT Press.

Nasser, I., & Wong, S. (2013). Examining social political contexts in teacher preparation in Palestine. *Teaching Education, 24*(4), 427–446. doi:10.1080/10476210.2012.739600.

Natale, M. J. (2002). Effect of a male-oriented computer gaming culture on careers in the computer industry. *Computers and Society, 32*(2), 24–31.

Nation, I. S. P. (1990). *Teaching & learning vocabulary.* New York,NY: Newbury.

Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.

Nation, I. S. P. (2004). A study of the most frequent word families in the British National Corpus. In P. Bogaards, & B. Laufer (Eds.), *Vocabulary in a Second Language* (pp. 3-14). Amsterdam: John Benjamins.

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review, 63*(1), 59-82.

Nation, I. S. P., & Kyongho, H. (1995). Where would general service vocabulary stop and special purposes vocabulary begin? *System, 23*(1), 35-41.

Nation, I.S. P. (2005). *Paul's vocabulary software [Comptuer Software and Manual].*

Nation, I.S.P. (2003). *Teaching and Learning Vocabulary*. Beijing: Foreign Language Teaching and Research Press.

Nation, P., & Meara, P. (2010). Vocabulary. In N. Schmitt (ed.), *An Introduction to Applied*

Linguistics (pp. 34-53). London: Hodder Education.

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

Neville, D. O., Shelton, B. E., & McInnis, B. (2009). Cybertext redux: Using digital game-based learning to teach L2 vocabulary, reading, and culture. *Computer Assisted Language Learning*, *22*(5), 409–424.

Newby, T., Stepich, D., Lehman, J., & Russell, J. (2006). *Educational Technology for Teaching and Learning.* New Jersey: Merrill Prentice Hall.

Newell, A., & Simon, H. A. (1972). *Human problem solving.* Englewood Cliffs, NJ: Prentice Hall.

NFER Teacher Voice Omnibus (2009). Using computer games in the classroom. Retrieved from: https://www.nfer.ac.uk/

Nicolai, S. (2007). *Fragmented foundations: Education and chronic crisis in the Occupied Palestinian Territory*. Paris: UNESCO International Institute for Educational Planning.

Norman, D. A. (1994). *Things that make us smart: defending human attributes in the age of the machine.* Reading, Mass.: Addison-Wesley Pub. Co.

Nosratinia, M. Divani,S. N. Zaker, A. (2013). Language Learners' Internal Factors and Practical Applications: A Case of Vocabulary Learning Strategies. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS), 17*(1), 100-115.

Nugroho, Y. K. (2007). *The Use of Circle Games as A Strategy to Improve the Students' Mastery in English Vocabulary (An Action Research in the Case of Elementary School Students of SDN 01)* (BA. Thesis). Semarang State University.

Nunan, D. (1999). *Second language teaching & learning.* Florence, KY: Heinle & Heinle.

O'Neil, H. F., Jr., Wainess, R., & Baker, E. L. (2005). Classification of learning outcomes: Evidence from computer games literature. *Curriculum Journal, 16*(4), 455-474.

O'Dwyer, L., & Bernauer, J. (2014). *Quantitative Research for the Qualitative Researcher.* SAGE Publications, Inc

O'Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition.* Cambridge, UK: Cambridge University Press.

Oblinger D. (2003). Boomers, gen-xers & millennial: understanding the new students. *EDUCAUSE Review, 38*(4), 37-47.

Oblinger, D. G., & Oblinger, J. L. (2005). *Educating the Net Generation.* Retreived from www.educause.ede/educatingthenetgen.

Oblinger, D.G., & Hanger, P. (2005). *Seminar on Educating the Net Generation.* Retrieved from http://www.educause.edu/section_params/conf/esem052/OneDayv2-HO.ppt#3

Omer, K. O. (2017). *Effect of Using Semantic Maps Strategy on the Development of*

Vocabulary Learning for Sudanese Secondary Schools' Students (Ph.D Thesis). Sudan University of Science &Technology, Sudan.

Oxford, R. L. (2011). *Teaching and researching language learning strategies.* London, UK: Pearson Longman.

Oxford, R.L. (1990). *Language learning strategies.* New York: Newbury House Publishers.

Oxford. R., Crookall, D. (1990). Vocabulary learning: A critical analysis of techniques. *TESL Canada Journal, 7*(2), 9-30.

Oyen, A.-S., & Bebko, J. M. (1996). The Effects of Computer Games and Lesson Contexts on Children's Mnemonic Strategies. *Journal of Experimental Child Psychology, 62*(2), 173-189. http://dx.doi.org/10.1006/jecp.1996.0027

Pacetti, E. (2008). *Improving the Quality of Education in Palestine through e-Learning and ICT: The Bottom-up Approach for a Sustainable Pedagogy.* Paper presented at the Conference of Knowledge Construction in E-learning Context: CSCL, ODL, ICT and SNA in education, Cesena, Italy, September 1-2.

Palestinian Central Bureau of Statistics (2011). *Press Release on the Main Findings of Household Survey on ICT.*

Palestinian Central Bureau of Statistics (PCBS) (2017). *Guide to Palestinian Statistics A–Z.* Retrieved from http://www.pcbs.gov.ps/site/lang__en/507/default.aspx?lang=en

Panoutsopoulos, H., & Sampson, D. (2012). A study on exploiting commercial digital games into school context. *Educational Technology& Society, 15*(1), 15-27.

Papathanasiou, E. (2009). An investigation of two ways of presenting vocabulary. *ELT Journal, 63* (4), 313-322.

Papert, S. (1993). *Mindstorms: Children, computers, and powerful ideas.* 2nd ed. New York: Basic Books.

Paraskeva, F., Mysirlaki, S., & Papagianni, A. (2010). Multiplayer online games as educational tools: Facing new challenges in learning. *Computers and Education*, *54*(2), 498–505. https://doi.org/10.1016/j.compedu.2009.09.001

Paribakht, T. S., & Wesche, M. (1993). Reading comprehension and second language development in a comprehension-based ESL program. *TESL Canada Journal, 11*(1), 9-29.

Pavlas, D., Heyne, K., Bedwell, W., Lazzara, E., & Salas, E. (2010). Game-based learning: The impact of flow state and videogame self-efficacy. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 54*(28), 2398-2402. doi: 10.1177/154193121005402808

Pavlou, V., & Vryonides M.V., M. (2009). Understanding Factors that Influence Teachers' Acceptance of Technology and Actual Computer use for Teaching: the Case of Greece. *Mediterranean Journal of Educational Studies*, *14*(2), 5–25. Retrieved from

http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=51459910&site=ehost-live&scope=site

Peacock, M., & Ho, B. (2003). Students'strategy use across eight disciplines. *International Journal of Applied Linguistics, 13*(2), 179–200.

Pellegrini, A. D., (2009). Research and policy on children's play. *Child Development Perspectives, 3*(2), 131-136.

Perrotta, C., Featherstone, G., Aston, H., & Houghton, E. (2013). *Game-based Learning: Latest Evidence and Future Directions*. Future Lab at NFER. Retrieved from: https://www.nfer.ac.uk/

Peterson, M. (2010a). Massively multiplayer online role-playing games. *Computer Assisted Language Learning, 23*(5), 429–439.

Peterson, M. (2010b). The use of computerized games and simulations in computer-assisted language learning: A meta-analysis of research. *Simulation & Gaming: An Interdisciplinary Journal, 41*(1), 863–885.

Peterson, M. (2012a). Language Learner Interaction in a Massively Multiplayer Online Role-Playing Game. In R. Hayo(Ed.), *Digital Games in Language Learning and* Teaching (pp. 70-94). United Kingdom: PALGRAVE MACMILLAN

Peterson, M. (2012b). Learner interaction in a massively multiplayer online role playing game (MMORPG): a sociocultural discourse analysis. *ReCALL, 24*, 361–380. doi:10.1017/S0958344012000195

Peterson, M. (2013). *Computer games and language learning*. New York, NY: Palgrave Macmillan.

Pica, T. (1994). Research on negotiation: What does it reveal about secondlanguage learning conditions, processes, and outcomes? *Language Learning, 44*(4), 493–527.

Piirainen-Marsh, A., & Tainio, L. (2009). Other-repetition as a resource for participation in the activity of playing a video game. *The Modern Language Journal, 93*(2), 153-169. doi:10.1111/j.1540-4781.2009.00853.x

Polat, N., Mancilla, R., & Mahalingappa, L. (2013). Anonymity and motivation in asynchronous discussions and L2 vocabulary learning. *Language Learning & Technology, 17*(2), 57–74. Retrieved from http://llt.msu.edu/issues/june2013/polatetal.pdf

Prensky, M. (2001a). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Prensky, M. (2001b). *Digital game-based learning* (1st ed.). St. Paul, MN: Paragon House.

Prensky, M. (2007). *Digital game-based learning* (2nd ed.). St. Paul, MN: Paragon House.

Prensky, M. (2009). H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom, *Innovate: Journal of Online Education*, 5(3), 1.

Proctor, P. (Ed.) (1996). *Cambridge International Dictionary of English*. Cambridge: Cambridge University Press.

Pujol, M. I. (2008). *The Influence of Age on Vocabulary Acquisition in English as a Foreign Language* (PhD thesis). Universidad de Barcelona. Retrieved from http://cataleg.ub.edu/search~S1*cat?/XEnglish+vocabulary+acquisition&searchscope=1&SORT=D/XEnglish+vocabulary+acquisition&searchscope=1&SORT=D&extended=0&SUBKEY=English+vocabulary+acquisition/1%2C3%2C3%2CB/frameset&FF=XEnglish+vocabulary+acquisition&searc

Punch, K. (2013). *Introduction to Social Research: Quantitative and Qualitative Approaches.* SAGE Publications.

Purushotma, R. (2005). You're not studying, you're just… *Language Learning and Technology, 9*(1), 80–96.

Purushotma, R., Thorne, S. L., & Wheatley, J. (2008). *Language learning and video games*. Paper produced for the Open Language & Learning Games Project, Massachusetts Institute of Technology, funded by the William and Flora Hewlett Foundation. Retrieved from http://knol.google.com/k/ravipurushotma/10-key-principles-fordesigning-video/27mkxqba7b13d/2

Qattan Center for Educational Research and Development (QCERD) (2001). *The Reality and Needs of the Educational Programs in the Higher Education Institutions: An Evaluative Study and a Vision for the Next Ten Years.* Ramallah, Palestine: QCERD.

Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review/La revue Canadienne des langues vivantes*, *56*(2), 282-308.

Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: an assessment perspective. *Language Learning 52*(3), 513-536.

Qteefan, G. (2012). *The Effectiveness of Using Educational Computer Games on Developing Palestinian Fifth Graders' Achievement in English Language in Gaza Governorate* (Master's thesis). The Islamic University of Gaza, Gaza.

Rama, P. S., Black, R. W., Van Es, E., & Warschauer, M. (2012). Affordances for second language learning in World of Warcraft. *ReCALL*, *24*(3), 322–338. https://doi.org/10.1017/S0958344012000171

Rankin, Y. A., McNeal, M., Shute, M. W., & Gooch, B. (2008). *User centered game design: Evaluating massively multiplayer online role playing games for second language acquisition*. Paper presented at the ACM SIGGRAPH '08 Sandbox, Los Angeles, CA, 11–18 August 2008. Retrieved from http://www.thegooch.org/.

Rankin, Y., Gold, R., & Gooch, B. (2006). 3D Role-Playing Games as Language Learning Tools. *Eurographics*, *25*(3), 25. Retrieved from http://webhome.cs.uvic.ca/~bgooch/Publications/PDFs/Rankin_Gold_Gooch.pdf

Rankin, Y., Morrison, D., & Shute, M. (2009). *Utilizing massively multiplayer online games to foster collaboration and learning.* Paper presenting at 2009 Atlanta Conference on Science and Innovation Policy, ACSIP 2009. https://doi.org/10.1109/ACSIP.2009.5367811

Ray, B. B., Powell, A., & Jacobsen, B. (2014). Exploring Preservice Teacher Perspectives on Video Games as Learning Tools. *Journal of Digital Learning in Teacher Education, 31*(1), 28–34. https://doi.org/10.1080/21532974.2015.979641

Ray, S. G. (2004). *Gender inclusive game design. Expanding the market.* Hingham, Massachusetts: Charles River Media, Inc.

Razak, A. A., Connolly, T., & Hainey, T. (2012). Teachers' Views on the Approach of Digital Games-Based Learning within the Curriculum for Excellence. *International Journal of Game-Based Learning, 2*(1), 33–51. https://doi.org/10.4018/ijgbl.2012010103

Read, J. (1988). Measuring the vocabulary knowledge of second language learners. *RELC Journal, 19*(2), 12-25.

Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing, 10*(3), 355–371.

Read, J. (1995). Refining the word associates format as a measure of depth of vocabulary knowledge. *New Zealand Studies in Applied Linguistics, 1,* 1-17.

Read, J. (1998). Validating a test to measure depth of vocabulary knowledge. In A. Kunnan (Ed.), *Validation in language assessment* (pp. 41-60). Mahwah, NJ: Lawrence Erlbaum.

Read, J. (2000). *Assessing vocabulary.* Cambridge: Cambridge University Press.

Read, J. (2000). *Assessing vocabulary.* Cambridge: Cambridge University Press.

Read, J. (2004). Plumbing the depths: How should the construct of vocabulary knowledge be defined? In P. Bogaards, & B. Laufer (Eds.), *Vocabulary in a second language. Selection, acquisition, and testing* (pp. 209–227). Amsterdam/Philadelphia, PA: John Benjamins.

Read, J. (2004). Plumbing the depths: How should the construct of vocabulary knowledge be defined? In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language* (pp. 209-227). Amsterdam: Benjamins.

Reese, D. D. (2007). First steps and beyond: Serious games as preparation for future learning. *Journal of Educational Multimedia and Hypermedia, 16*(3), 283.

Reinders, H. (2006). The effects of different task types on L2 learners' intake and acquisition of two English grammatical structures (PhD thesis). University of Auckland, Auckland.

Reinders, H. (2012). *Digital Games in Language Learning and Teaching. Digital Games in Language Learning and Teaching.* https://doi.org/10.1057/9781137005267

Reinders, H., & Wattana, S. (forthcoming) Can I say something? The effects of digital game

play on willingness to communicate. *Language Learning & Technology, 18*(2), 101-123.

Reinders, H., & Wattana, S. (2012). Talk to Me! Games and Students' Willingness to Communicate. In H. Reinders (Ed.), *Digital games in language learning and teaching* (pp. 32–49). London, UK: Palgrave Macmillan.

Reinhardt, J., & Sykes, J.M. (2012). Conceptualizing digital game-mediated L2 learning and pedagogy: Game-enhanced and game-based research and practice. In H. Reinders (Ed.), *Digital games in language learning and teaching* (pp. 32–49). London, UK: Palgrave Macmillan.

Reiss, J. (2008). *102 content strategies for English language learners: Teaching for academic success in grades 3-12* (pp. 65- 67). Upper Saddle River, NJ: Pearson Education.

Rice, J. W. (2007). New Media Resistance: Barriers to Implementation of Computer Video Games in the Classroom. *Journal of Educational Multimedia and Hypermedia, 16*(3), 249.

Richards, J. C. (1976). The role of vocabulary teaching. *TESOl Quarterly*, *3*, 77-89.

Richards, J. C., & Renandya, W. A. (2002). *Methodology in language teaching: An anthology of current practice*. New York: Cambridge University Press.

Ringboom, H. (1985). On L1 transfer in L2 comprehension and L2 production. *Language Learning: A Journal of Research in Language Studies, 42*(1), 85-112. https://doi.org/10.1111/j.1467 1770.1992.tb00701.x

Robert, G. (2005). Technology and Learning Expectations of the Net Generation. In D. Oblinger, & J. L. Olinger (Eds.), *Educating the Net Generation* (pp. 3.1-3.7). Washington, DC: EDUCAUSE.

Robertson, J., & Howells, C. (2008). *Computer game design: Opportunities for successful learning. Computers & Education, 50*(2), 559-578.

Robson, C. (1993). *Real world research: A resource for social scientists and practitioner-researchers*. Blackwell: Oxford; Cambridge.

Rojananak, K., & Vitayapirak, J. (2015). Comparison of English vocabulary learning strategies for good and weak learners at kaing Mongkut's Institute of Technology. *International Journal of Language, Literature and Linguistics, 1*(1), 1-5.

Rorty, R. (1991). *Objectivity, Relativism and Truth*. Cambridge: Cambridge University Press.

Rowan, L., Stieler-Hunt, C., Thompson, R., Zagami, J., Dezuanni, M., O'Mara, J., … McGillivray, C. (2014). Teachers' Beliefs about the Possibilities and Limitations of Digital Games in Classrooms. *E-Learning and Digital Media*, *11*(6), 569–581. https://doi.org/10.2304/elea.2014.11.6.569

Rua, P. L. (2006*). The sex variable in foreign language learning: An integrative approach.*

Porta Linguarum, 6, 99-114.

Rubin, J. (1987). Learner strategies: Theoretical assumptions, research history and typology. In A. L. Wenden, & J. Rubin (Eds.), *Learner Strategies in language learning* (pp. 15-30). Englewood Cliffs, NJ: Prentice-Hall.

Rubin, J., & Thompson, I. (1994). *How to be a more Successful Language Learner: Toward Learner Autonomy* (2nd ed.). Boston, MA: Heinle & Heinle.

Ruiz-Cecilia, R. (2013). Estudio empírico sobre la adquisición de vocabulario en lengua extranjera. *RLA. Revista de Lingüística Teórica y Aplicada*, *51*(2), 105-125.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25,* 54-67.

Ryan, R. M., Rigby, C. S., and Przybylski, A. (2006). The Motivational Pull of Video Games: A Self-Determination Theory Approach. *Motivation and Emotion, 30*(4), 344-360.

Saettler, P. (1968). *A history of instructional technology.* New York: McGraw-Hill.

Saffanian, R., & Gorjian, B. (2012). Effect of computer-based video games for vocabulary acquisition among young children: An experimental study. *Journal of Comparative Literature and Culture, 1*(3), 44-48.

Sahrir, M. S., & Yusri, G. (2012). Online Vocabulary Games For Teaching And Learning Arabic. *GEMA Online Journal of Language Studies, 12*(3).

Saleem, M. (2002). *The Developmental Psychology.* Beirut: Arab renaissance house.

Salen, K., and Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals.* United Kingdom: The MIT Press Cambridge.

Salen, K., Torres, R., Wolozin, L., Rufo-Tepper, R. and Shapiro, A. (2011). *Quest to Learn: Developing the School for Digital Kids.* Cambridge, MA: MIT Press.

Sandford, R., Ulicsak, M., Facer, K., & Rudd, T. (2006). *Teaching with Games: Using commercial off-the-shelf computer games in formal education.* Retrieved from https://www.nfer.ac.uk/publications/FUTL49/FUTL49.pdf van

Santo, R., James, C., Davis, K., Katz, S. L., Burch, L., & Joseph, B. (2009). *Meeting of minds: Cross-generational dialogue on the ethics of digital life. Global Kids' Digital Media Initiative*. Retrieved from http://www.macfound.org/atf/cf/ %7Bb0386ce3-8b29-4162-8098-e466fb856794%7D/DML-FOCUS-DIALOGUEREPORT-0910.PDF

Sanusi, E. (2009). The Techniques of Teaching Vocabulary. *Ittihad Jurnal Kopertis Wilayah XI Kalimantan, 7*(11).

Saputra, G. (2007). *The Influence of Contextual Teaching Learning to the Students Vocabulary Achievement* (Unpublished Master's Thesis). University of As- Syafi"iyah, East Jakarta.

Savery, J., & Duffy, T. (1996). Problem based learning: An instructional model and its

constructivist framework. In B. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 135-148). Englewood Cliffs, NJ: Educational Technology Publications.

Saville-Troike, M. (2012). *Introducing Second Language Acquisition.* Cambridge: Cambridge University Press.

Scarcella, R. C., & Oxford, R. L. (1992). *The tapestry of language learning: The individual in the communicative classroom.* Boston, MA: Heinle & Heinle.

Schank, R., & Neaman, A. (2001). Motivation and failure in educational simulation design. In K. D. Forbus, & P. J. Feltovich (Eds.), *Smart machines in education* (pp. 37-69). Cambridge, MA: MIT Press.

Schlimme, M. (2002). *Video games: A source of benefit or addiction?* (Unpublished student paper). Serendip (a web publication of Bryn Mawr College).

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11*(2), 129-158.

Schmitt, N. (1998). Tracking the incremental acquisition of second language vocabulary: a longitudinal study. *Language Learning, 48*, 281-317.

Schmitt, N. (2000). *Vocabulary in Language Teaching. Cambridge.* U.K: Cambridge University Press.

Schmitt, N. (2002). Learning Vocabulary in Another Language. I.S.P. Nation. *ELT Journal*, *56*(1), 91–93. https://doi.org/10.1093/elt/56.1.91

Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research, 12*(3), 329 – 363.

Schmitt, N. (2010). *Researching Vocabulary. A Vocabulary Research Manual.* Basingstoke: Palgrave Macmillan.

Schmitt, N., & Meara, P. (1997). Researching vocabulary through a word knowledge framework: word associations and verbal suffixes. *Studies in Second Language Acquisition, 20*, 17-36.

Schmitt, N., & Schmitt, D. (1995). Vocabulary notebooks: Theoretical underpinnings and practical suggestions. *ELT Journal, 49*(2), 133-143.

Schmitt, N., Schmitt, D., & Clapham, P. (2001). Developing and exploring the behaviour of new versions of the Vocabulary Levels Test. *Language Testing, 18,* 55-88.

Schneider, V. I., Healy, A. F., & Bourne, L. E., Jr. (2002). What is learned under difficult conditions is hard to forget: Contextual interference effects in foreign vocabulary acquisition, retention and transfer. *Journal of Memory and Language,46,* 419–440.

Schrader, P. G., Zheng, D., & Young, M. (2006). Teachers' Perceptions of Video Games: MMOGs and the Future of Preservice Teacher Education. *Innovate: Journal of Online Education, 2*(3).

Schwienhorst, K. (2002). The State of VR: A Meta-Analysis of Virtual Reality Tools in Second Language Acquisition. *Computer Assisted Language Learning, 15*(3), 221-239.

Sedita, J. (2005) Effective Vocabulary Instruction. *Insights on Learning Disabilities*, 2 (1), 33-45.

Segers, E., & Verhoeven, L. (2003). Effects of vocabulary training by computer on kindergarten. *Journal of Computer Assisted Learning, 19*, 557-566. https://doi.org/10.1046/j.0266-4909.2003.00058.x

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.

Shahraki, S. H., & Kassaian, Z. (2011). Effects of learner interaction, receptive and productive learning tasks on vocabulary acquisition: An Iranian case. *Procedia - Social and Behavioral Sciences*, *15*, 2165–2171. https://doi.org/10.1016/j.sbspro.2011.04.073

Shahriarpoura, N., & Kafib, Z. (2014). On the Effect of Playing Digital Games on Iranian Intermediate EFL Learners' Motivation toward Learning English Vocabularies. *Procedia - Social and Behavioral Sciences*, 98, 1738 – 1743.

Shahrori, M. H., & Rimawi, M. O. (2011). The Effect of Electronic Games on Memorizing, Problem Solving and Decision Making among Middle Childhood Jordanian Children. *Researches, Faculty of Educational Sciences, University of Jordan, 38(*2), 637-649.

Sharp, A. L. (2012). Stealth Learning: Unexpected Learning Opportunities through Games. *Journal of Instructional Research*, 1, 42-48

Shashaani, L., & Khalili, A. (2001). Gender and computers: Similarities and differences in Iranian college students' attitudes toward computers. *Comput. Educ., 37*, 363–375.

Sheese, B. E., & Graziano, W. G. (2005). Deciding to Defect. The Effects of Video-Game Violence on Cooperative Behavior. *Psychological Science, 16*(5), 354–357. doi:10.1111/j.09567976.2005.01539.x PMID:15869692.

Shehadeh, A., & Dwaik, R. (2013). The practice of teaching English to young learners in the Palestinian context: a multidimensional analysis. *AWEJ, 4*(3) 63-76. Singleton

Shen, C., Ratan, R., Cai, YD, & Leavitt, A. (2016). Do Men Advance Faster Than Women? Debunking the Gender Performance Gap in Two Massively Multiplayer Online Games. *Journal of Computer-Mediated Communication, 21*(4), 312-329.

Shields, R. (2003). *The virtual.* London: Routledge.

Shneiderman, B. (2004). Designing for fun: How to make user interfaces more fun. *ACM Interactions, 11,* 48-50.

Shokri, H., & Abdolmanafi-Rokni, J. (2014). The impact of computer games on EFL learners' spelling: A qualitative study. *Studies In English Language Teaching, 2*(2), 266-274.

Shraim, K., & Khlaif, Z. (2010). An e-learning approach to secondary education in Palestine:

Opportunities and challenges. *Information Technology for Development, 16*(3), 159–173.

Siang, A. C., & Rao, R. K. (2003). *Theories of Learning: A Computer Game Perspective.* Paper presented in IEEE Fifth International Symposium on Multimedia Software Eengineering, Taipei, Taiwan

Sibold, C. (2017). Building English language learners' academic vocabulary: strategies & tips. *Multicultural Education*, *18*(Winter 2011), 24.

Simensen, A. M. (2010). English in Scandinavia – a success story. In D. Wise, R. Andrews, & J. V. Hoffman (Eds.), *The Routledge International Handbook of English, Language and Literacy Teaching*. London: Routledge

Simons, J., Vansteenkiste, M., Lens, W., & Lacante, M. (2004). Placing motivation and future time perspective theory in a temporal perspective. *Educational Psychology Review, 16,* 121–139

Singh, V. K. (2003). *Does Multimedia really improve learning effectiveness?* Paper presented at the Asia Pacific Conference on Education, Re-envisioning Education: Innovation and Diversity, Singapore.

Singleton, D. (1999). *Exploring the Second Language Mental Lexicon*. Cambridge: Cambridge University Press.

Slattery, M., & Willis, J. (2001). *English for Primary Teachers*. Oxford University Press: Oxford.

Smaldino, Sh., Lowther, D., & Russell, J. (2009). *Instructional Technology and Media for Learning. 9th edition.* New Jersey: Merril Prentice Hall.

Smed, J., & Hakonen, H. (2003). Towards a definition of a computer game. Turku Centre for Computer Science Technical Report *(553)*14. Retrieved from http://staff.cs.utu.fi/~jounsmed/papers/TR553.pdf

Sockett, G., & Toffoli, D. (2012). Beyond learner autonomy: A dynamic systems view of the informal learning of English in virtual online communities. *ReCALL, 24*(2): 138-151.

Sorensen, B. H., & Meyer, B. (2007). *Serious games in language learning and teaching-a theoretical perspective.* In Proceedings of the 2007 Digital Games research Association Conference (pp. 559-566).

Sorour, K. (2009). *A suggested Program for Tackling Low English Achievement Level Among Sixth Graders in Gaza UNRWA Schools* (Master's thesis). Islamic University, Gaza.

Spada, N. (2007). *International Handbook of English*. *International handbook of English*. https://doi.org/10.1007/978-3-642-30129-2

Spingytė, A., & Jasnauskaitė, R. (2016). IT in Teaching-Learning New English Vocabulary for and by Pupils of The School of General Education. *Mokslo taikomieji tyrimai*

Lietuvos kolegijose, 1(12), 190-196.

Squire, K. (2001). Cultural framing of computer games. *The international journal of computer game, 2*(1).

Stahl, S. A. (2005). Four problems with teaching word meanings and what to do to make vocabulary an integral part of instruction. In E.H. Hiebert and M.L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 095-114). Mahwah, NJ: Erlbaum.

Steinkuehler, C. (2007). Massively multiplayer online gaming as a constellation of literacy practices. *ELearning, 4*(3), 297–318.

Steinkuehler, C. A. (2004). *Learning in massively multiplayer online games.* Paper presented at the international conference of the learning sciences, Santa Monica, CA.

Stieler-Hunt, C. J., & Jones, C. M. (2015a). Educators who believe: understanding the enthusiasm of teachers who use digital games in the classroom. *Research in Learning Technology, 23*. doi: 10.3402/rlt.v23.26155.

Stieler-Hunt, C. J., & Jones, C. M. (2015b). *A model for exploring the usefulness of games for classrooms.* Proceedings of the Digital Games Research Association (DiGRA) 2015 Conference: Diversity of Play, Lüneburg, Germany.

Stop the Wall: The Palestinian Grassroots Anti-Apartheid Wall Campaign (2007). *Education under occupation.*

Strauss, W., & Howe, N. (2003). *Millennials go to college: Strategies for a new generation on campus.* Great Falls, VA: American Association of Collegiate Registrars.

Strauss, W., & Howe, N. (2006). *Millennials and the pop culture: Strategies for a new generation of consumers in music, movies, television, the Internet, and video games.* Great Falls, VA: LifeCourse Associates.

Suh, S., Kim, S. W., & Kim, N. J. (2010). Effectiveness of MMORPG-based instruction in elementary English education in Korea. *Journal of Computer Assisted Learning, 26(*5), 370–378.

Sullivan, E. J., & Gray, G. (2002). Efficacy of Computer Games on Language Learning Blanka. *Journal of Professional Nursing, 18*(5), 245–246.

Sundqvist, P. (2009). *Extramural English Matters.* (PhD thesis). Karlstad University, Karlstad.

Sundqvist, P., & Sylvén, L. K. (2012). World of VocCraft: Computer games and Swedish learners' L2 English vocabulary. In H. Reinders (Ed.), *Digital games in language learning and teaching* (pp. 189-208). London: Palgrave Macmillan UK. doi:10.1057/9781137005267_10

Sundqvist, P., & Sylvèn, L. K. (2014). Language-related computer use: Focus on young L2 English learners in Sweden. *ReCALL, 26,* 3-20.

https://doi.org/10.1017/S0958344013000232

Sütheő, C. (2004). *Using Online Resources in Teaching Vocabulary*. Retrieved from: www.nefmi.gov.hu/nemzetkozikapcsolatok/cikkajanlo/sutheo. Warschauer

Sutton-Smith, B. (1986). *Toys as Culture.* New York: Gardner Press

Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass, & C. Madden (Eds.), *Input in second language acquisition* (pp. 235-253). Rowley, MA: Newbury House.

Swain, M. (2000). The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 97–114). Oxford: Oxford University Press.

Swan, M. (1997). The influence of mother tongue on second language vocabulary acquisition and use. In N. Schmitt, & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 156-180). UK: Cambridge University Press.

Sweeny, S., Mason, P. (2011). *Research-based Practices in Vocabulary Instruction: An Analysis of What Works in Grades PreK-12*, Report for: Studies & Research Committee of the Massachusetts Reading Association, MA, USA.

Sykes, J. (2010). Multi-user virtual environments: User-driven design and implementation for language learning. In G. Vicenti & J. Braman (Eds.), *Teaching through multi-user virtual environments: Applying dynamic elements to the modern classroom.* Hershey, PA: IGI Global.

Sykes, J. (2013). TecHnology—"Just" Playing Games? A Look at the Use of Digital Games for Language Learning. *The Language Educator,* 32-35.

Sykes, J. M., & Reinhardt, J. (2012). *Language at play: Digital games in second and foreign language teaching and learning*. Prentice Hall.

Sykes, J. M., & Reinhardt, J. (2014). Digital Game and Play Activity in L2 Teaching and Learning. *Language Learning & Technology*, *18*(2), 1–7. Retrieved from papers3://publication/uuid/619E0A32-54B3-4CAA-BFC9-3C1AD2AD8ACC

Sykes, J., Reinhardt, J., & Thorne, S. L. (2010). Multiplayer digital games as sites for research and practice. In F. Hult (Ed.), *Directions and prospects for educational linguistics* (pp. 117–136). New York: Springer.

Sylvén, L. K. (2004) *Teaching in English or English teaching? On the effects of content and language integrated learning on Swedish learners' incidental vocabulary acquisition*. (PhD dissiertation). University of Gothenburg, Gothenburg.

Sylvén, L. K., & Sundqvist, P. (2012). Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL, 24*(3), pp 302-321 doi:10.1017/S095834401200016X

Ta'amneh, M. A. A. A. (2015). Exploring the Harmony between Jordanian EFL Teachers'

and Students' Beliefs about Vocabulary Learning Strategies. *Journal of Language Teaching and Research*, *6*(1), 78. https://doi.org/10.17507/jltr.0601.09

Taheri, M. (2014). The Effect of Using Language Games on Vocabulary Retention of Iranian Elementary EFL Learners. *Journal of Language Teaching and Research*, *5*(3), 544–549. https://doi.org/10.4304/jltr.5.3.544-549

Tajfel, H., & Fraser, C. (Eds.). (1978). *Introducing social psychology: An analysis of individual reaction and response.* New York, NY, US: Penguin Press.

Takac, V. P. (2008). *Vocabulary learning strategies and foreign language acquisition.* Great Britain: Multilingual Matters.

Tan, E. S., & Jansz, J. (2008), The game experience. In R. Schifferstein & P.P. Hekkert (Eds.) *Product Experience* (pp. 531-556). Amsterdam: Elsevier. http://dare.uva.nl/record/312093

Tapscott, D. (1997). *Growing up digital: The rise of the net generation.* NY: McGraw-Hill.

Tapscott, D. (2009). *Growing up digital: How the net generation is changing your world.* NY: McGraw-Hill.

Taylor, L. (1990). *Teaching and learning vocabulary.* Herefordshire, UK: Prentice Hall international.

Tekmen, E. A. F., & Daloğlu, A. (2006). An investigation of incidental vocabulary acquisition in relation to learner proficiency level and word frequency. *Foreign Language Annals, 39*(2), 220-243.

Thomas, A. (2007). *Youth online: Identity and literacy in the digital age.* New York, NY: Peter Lang

Thomas, M. (2012). Contextualizing Digital Game-Based Language Learning: Transformational Paradigm Shift or Business as Usual?. In R. Hayo(Ed.), *Digital Games in Language Learning and Teaching* (pp.11-31). United Kingdom: PALGRAVE MACMILLAN

Thomas, M. (Ed.). (2011). *Deconstructing digital natives: Young people, technology and the new literacies.* London & New York: Routledge.

Thornbury, S. (2002). *How to teach vocabulary.* England: Pearson Education Limited.

Thorne, S. L. (2008). Transcultural communication in open internet environments and massively multiplayer online games. In S. Magnan (ed.), *Mediating Discourse Online* (pp.305–327). Amsterdam: John Benjamins

Thorne, S. L. (2010). The intercultural turn and language learning in the crucible of new media. In F. Helm & S. Guth (Eds.), *Telecollaboration 2.0 for language and intercultural learning* (pp. 139–164). Bern: Peter Lang.

Thorne, S. L. (2012) Gaming writing: Supervernaculars, stylization, and semiotic remediation. In G. Kessler, A. Oskoz, & I. Elola (Eds.), *Technology Across Writing*

Contexts and Tasks (pp. 297-316). CALICO Monograph: San Marcos, Texas.

Tierney, S. (2008). *Experimental (quantitative) studies: An overview and general issues,* 1–8. Retrieved from http://www.researchdirectorate.org.uk/merg/documents/Experimental Studies.pdf

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.

Trochim, W. M., & Donnelly, J. P. (2006). *The Research Methods Knowledge Base*. 3rd Edition, Atomic Dog, Cincinnati, OH.

Turgut, Y., & Irgin, P. (2009). Young learners' language learning via computer games. *Procedia, Social and Behavioral Sciences, 1*, 760-764. https://doi.org/10.1016/j.sbspro.2009.01.135

Turkay, S., & Adinolf, S. (2012). What do players (think they) learn in games?. *Procedia - Social and Behavioral Sciences, 46,* 3345 – 3349. doi: 10.1016/j.sbspro.2012.06.064. Retrieved from www.sciencedirect.com

Tushyeh, H. (1990). *The English Language Teaching Situation in the West Bank*. Jerusalem, AMIDEAST.

Tuzun, H., Yilmaz-Sollu, M., Karakus, T., Inal, Y., & Kizilkaya, G. (2008). The effects of computer games on primary school student's achievement and motivation in geography learning. *Computers & Education, 52*(1), 68-78.

Uberman, A. (1998). The use of games for vocabulary presentation and revision. *Forum, 36*(1), 20-27.

Underwood, J., Luckin, R., & Winters, N. (2014). Mall In The Wild: Learners' Designs For Scaffolding Vocabulary Learning Trajectories. In S. Jager, L. Bradley, E. J. Meima, and S. Thouësny (Eds), *CALL Design: Principles and Practice* (pp. 391-397*)*. Proceedings of the 2014 EUROCALL Conference, Groningen, The Netherlands Dublin: Research-publishing.net.

Underwood, M. (1989). *Teaching listening*. New York: Longman.

Ur, P. (l996). *A Course in language teaching: Practice and theory*. Cambridge: Cambridge University Press.

Uuskoski, O. (2011). *Playing video games: A waste of time... or not? : Exploring the connection between playing video games and English grades*. Helsingfors universitet.

Uzun, L. (2009). An Evaluative Checklist for Computer Games Used for Foreign Language Vocabulary Learning and Practice: Vocaword Sample. *NOVITAS-ROYAL: Research in Youth and Language*, *3*(1), 45-59.

Vahdat, S., & Rasti-Behbahani, A. (2013). The effect of video games on Iranian EFL learners' vocabulary learning. *The Reading Matrix, 13*(1), 61-71.

Väisänen, A. (2018). *Learning English through Video Games: Finnish Learners'*

257

Experiences. (Master's Thesis). University of Jyväskylä

Valenza, J. K. (1997). Girls + technology = turnoff? *Technology Connection, 3*(10), 20-22.

Van Eck, R. (2007). Building artificially intelligent learning games. In D. Gibson, C. Aldrich, & M. Prensky (Eds.), *Games and simulations in online learning research & development frameworks* (pp. 271–307). Hershey, PA: Idea Group.

Vandercruysse, S., Vandewaetere, M., & Clarebout, G. (2012). Game-based learning: A Review on the effectiveness of educational games. In M. M. Cruz-Cunha (Ed.), *Handbook of research on serious games as educational, business and research tools: Development and design* (pp. 628-647). Hershey, PA: IGI Global. https://doi.org/10.4018/978-1-4666-0149-9.ch032

Vasileiadou, I., & Makrina, Z. (2017). Using Online Computer Games in the ELT Classroom: A Case Study. *English Language Teaching*, *10*(12), 134.

Vela, V., & Rushidi, J. (2016). The Effect of Keeping Vocabulary Notebooks on Vocabulary Acquisition and Learner Autonomy. *Procedia - Social and Behavioral Sciences*, *232*, 201–208. https://doi.org/10.1016/j.sbspro.2016.10.046

Verenikina, I. M. (2010). Vygotsky in Twenty-First-Century research. *World Conference on Educational Multimedia, Hypermedia and Telecommunications*, 16–25. Retrieved from http://ro.uow.edu.au/cgi/viewcontent.cgi?article=2337&context=edupapers

Verliyani, Y. (2016). The effect of ostensive approach on improving students' vocabulary achievement, a case of SMPN 10 Kendari. *Journal of Teaching of English, 1*(2).

Vidlund, L. (2015). *English in video and online computer games- Potential enhancement of players' vocabulary.*(B.A thesis). Linneuniversitetet. Retreived from http://lnu.diva-portal.org/smash/record.jsf?pid=diva2%3A642772&dswid=-5811

Vygotsky, L. S. (1986). *Thought and language.* Cambridge, MA: MIT Press.

Wadsworth, B. J. (2003). *Piaget's Theory of Cognitive and Affective Development: Foundations of Constructivism.* Allyn and Bacon Classics Edition (5th Edition).

Wahbeh, N. (2006). *ICT and education in Palestine: Social and educational inequalities in access to ICT: A case study approach*. Ramalla, Palestine: Qattan Center for Educational Research and Development.

Wahbeh, N. A. (2003). Teaching and learning science in Palestine: Dealing with the new Palestinian science curriculum. *Mediterranean Journal of Educational Studies, 8,* 135–159.

Wahbi, M. Kh. (2000). *Teacher Education in Palestine: Understanding Teachers Realities and Development through Action Research*. Ramallah, Palestine.

Walker, A., & White, G. (2013). *Technology enhanced language learning.* Oxford: Oxford University Press.

Walters, J., Bozkurt, N. (2009). The Effect of Keeping Vocabulary Notebooks on Vocabulary

Acquisition. *Language Teaching Research, 13*(4), 403 – 423.

Wang, B. T., Teng, C. W., & Chen, H. T. (2015). Using iPad to Facilitate English Vocabulary Learning. *International Journal of Information and Education Technology*, *5*(2), 100–104. https://doi.org/10.7763/ijiet.2015.v5.484

Wang, L., & Zhu, S. (2011). *Online game addiction among university students* (Master's thesis). Available from DiVA – Academic Archive Online database.

Wang, Y. H. (2010). Using communicative language games in teaching and learning English in Taiwanese primary schools. *Journal of Engineering Technology and Education, 7*(1), 126-142.

Waters, J. K. (2007). On a quest for English. T. H. E. Journal, 34(10), 26–32.

Webb, S. (2005). Receptive and productive vocabulary learning: The effects of reading and writing on word knowledge. Studies in Second Language Acquisition, 27, 33–52.

Webb, S., Newton, J., & Chang, A. (2013). Incidental learning of collocation. *Language Learning, 63*(1), 91-120.

Wenden, A. L. (1987). Conceptual background and utility. In A. L. Wenden & J. Rubin (Eds.), *Learner Strategies in language learning* (PP. 3-13). Englewood Cliffs, NJ: Prentiee-Hall.

Wenden, A. L., & Rubin, J. (1987). *Learner Strategies in Language Learning.* Englewood Cliffs, NJ: Prentice-Hall.

Werbach, K., & Hunter, D. (2012). *For the Win: How game thinking can revolutionize your business*. Wharton Digital Press.

White, D. J., Congedo, M., Ciorciari, J., & Silberstein, R. B. (2012). Brain oscillatory activity during spatial navigation: theta and gamma activity link medial temporal and parietal regions. *J. Cogn. Neurosci., 22,* 686–697. doi: 10. 1162/jocn_a_00098

White, D. S., & Le Cornu, A. (2011). Visitors and residents: A new typology for online engagement. First Monday, 16(9), 1–15.

Whitebread, D., Basilio, M., Kuvalja, M., & Verma, M. (2012). *The importance of play: A report on the value of children's play with a series of policy recommendations*. Brussels, Belgium: Toys Industries for Europe.

Whitton, N. (2010). *Learning with digital games: A practical guide to engaging students in higher education.* New York: Routledge.

Whitton, N. (2012). The place of game-based learning in an age of austerity, *Electronic Journal of E-Learning, 10*(2), 249-256,

Wideman, H. H., Owston, R. D., Brown, C., Kushnirk, A., Ho, F., Pitts, K. C. (2007). Unpacking the potential of educational gaming: a new tool for gaming. *Simulation and Gaming, 38*(1), 10-30.

Wilkins, D. A. (1972). *Linguistics and language teaching*. London: Edward Arnold.

Winne, P. H., & Perry, N. E. (2000). Measuring self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 531-566). San Diego, CA, US: Academic Press.

Wong, E. M. Y. (2014). A case study of the vocabulary learning strategy use of twenty Chinese ESL learners in Australia. *A Case Study of the Vocabulary Learning Strategy Use of Twenty Chinese ESL Learners in Australia*, (February). Retrieved from https://manchester.idm.oclc.org/login?url=http://dialog.proquest.com/professional/docview/1821695221?accountid=12253%5Cnhttp://man-fe.hosted.exlibrisgroup.com/openurl/44MAN/44MAN_services_page?url_ver=Z39.88-2004&rft_val_fmt=dissertation&genre=unknown&sid

Wood, J. (2001). Can software support children's vocabulary development? *Language Learning & Technology, 5*(1), 166–201.

Wood, L. C., & Reiners, T. (2015). Gamification. In M. Khosrow-Pour (Ed.), *Encyclopedia of Information Science and Technology* (3rd ed., pp. 3039-3047). Hershey, PA: Information Science Reference. DOI: 10.4018/978-1-4666-5888-2.ch297

Woolfolk, A. E. (1993). *Educational psychology,* Boston: Allyn and Bacon.

Wright T. A. (2003). Positive organizational behavior: An idea whose time has truly come. *Journal of Organizational Behavior, 24,* 437–442.

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. *ELSEVIER Computers & Education, 62*, 41-49. https://doi.org/10.1016/j.compedu.2012.10.024

Wu, Y. (2008). Language learning strategies used by students at different proficiency levels. *Asian EFL Journal, 10(*4), 75–95.

Xeniya, K. (2015). Gender and video games: How is female gender generally represented in various genres of video games? *Journal of Comparative Research in Anthropology and Sociology Bucharest, 6*(1), 171-193

Yahya, M. (2012). A Study of the Language Difficulties of the English Language. *Asian Journal of Management Sciences and Education*, *1*(2), 119–130.

Yamchi, N. (2006). English teaching and training issues in Palestine. *TESOL Quarterly, 40*(4), 861–865.

Yang, N. D. (1999). The Relationship between EFL Learners Beliefs and Learning Strategies. *System, 27*, 515-535.

Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. *Modern Language Journal, 86,* 55-66.

Yee, N. (2006). The Demographics, Motivations and Derived Experiences of Users of Massively-Multiuser Online Graphical Environments. *PRESENCE: Teleoperators and*

Virtual Environments, 15, 309-329.

Yi, Y. (2005). Asian adolescents' out-of-school encounters with English and Korean literacy. *Journal of Asian Pacific Communication, 15(*1), 57–77.

Yildirim, I. (2017). The Effects of Gamification-Based Teaching Practices on Student Achievement and Students' Attitudes toward Lessons*. Internet and Higher Education, 33,* 86-92.

Yip, F. W. M., & Kwan, A. C. M. (2006). Online vocabulary games as a tool for teaching and learning English vocabulary. *Educational Media International*, *43*(3), 233–249. https://doi.org/10.1080/09523980600641445

Yılmaz, Y. (2015). Learning vocabulary in a foreign language: A computer software based model attempt. *Journal of Language and Linguistic Studies, 11*(2), 23-38.

Yolageldili, G., & Arikan, A. (2011). Effectiveness of Using Games in Teaching Grammar to Young Learners. *Elementary Education Online, 10(*1), 219-229, 2011. Retrieved from: http://ilkogretim-online.org.tr.

Young, K. (2007). Cognitive Behavior Therapy with Internet Addicts: Treatment Outcomes and Implications. *Cyberpsychology & behavior: the impact of the Internet, multimedia and virtual reality on behavior and society, 10(5)*, 671-9.

Young, K. S. (1996). Psychology of computer use: XL. Addictive use of Addictive use of the Internet: a case that breaks the stereotype. *Psychological Reports, 79*, 899–902.

Young, S. S., & Wang, Y. (2014). The game embedded CALL system to facilitate English vocabulary acquisition and pronunciation. *Journal of Educational Technology & Society*, *17*(3), 239–251.

Yu-Ling, L. (2005). *Teaching Vocabulary Learning Strategies: Awareness, Beliefs, and Practices. A Survey of Taiwanese EFL Senior High School Teachers* (MA thesis). University of Essex.

Yudintseva, A. (2015). Game-enhanced second language vocabulary acquisition strategies: A systematic review. *Open Journal of Social Sciences, 3*, 101-109. https://doi.org/10.4236/jss.2015.310015

Zahran, H. (1986). *The Developmental Psychology: Childhood and adolescence.* Cairo: House of knowledge.

Zarina C. H., & Hanafizan H. (2005). Analysis of local and foreign edutainment products - An effort to implement the design framework for an edutainment environment in Malaysia. Multimedia University, Malaysia. *The Journal of Computers in Mathematics and Science Teaching, 24*(1), 27-42.

Zdybiewska, M. (1994). *One-Hundred Language Games.* Warszawa: Wsip.

Zechmeister, E. B., Chronis, A. M., Cull, W. L., D'Anna, C. A., & Healy, N. A. (1995). Growth of a Functionally Important Lexicon. *Journal of Reading Behavior*, *27*(2),

201–212. https://doi.org/10.1080/10862969509547878

Zengin, B., & Yetkin Aker, D. (2016). Education policy and the effect of subtitle options in learning process: A case of Turkish students as English language learners. *Humanitas, A Journal of Social Sciences, 4*(7), 485-498. https://doi.org/10.20304/husbd.88126

Zhang, J. L., & Anual, S. B. (2008). The role of vocabulary in reading comprehension: The case of secondary school students learning English in Singapore. *Journal of Regional Language Center Journal, 39*(1), 51-76. doi:1177/0033688208091140

Zhang, Y., Lin,Ch., Zhang,D., & Choi, Y. (2017) Motivation, strategy, and English as a foreign language vocabulary learning: A structural equation modelling study. *British Journal of Educational Psychology, 87,* 57-74.

Zheng, D., Bischoff, M., & Gilliland, B. (2015). *Vocabulary Learning in Massively Multiplayer Online Games: Context and Action before Words.* University of Hawaii.

Zheng, D., Young, M. F., Brewer, R. A., & Wagner, M. (2009). Attitude and self-efficacy change: English language learning in virtual worlds. *CALICO Journal, 27*(1), 205–231. Retrieved from http://www.jstor.org/stable/ calicojournal.27.1.20

Zichermann, G., & Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*. O'Reilly Media.

APPENDICES

Appendix A

The Research tools

Questionnaire (A1)

UNIVERSIDAD
DE GRANADA

Escuela de Doctorado de Humanidades y Ciencias Sociales y Jurídicas

Programa de Doctorado en Ciencias de la Educación

Questionnaire

Dear Teachers,

The following questionnaire has been developed to collect the necessary information for accomplishing PhD thesis at Universidad de Granada entitled " **Incidental Learning of English Vocabulary through Online Computer Games: A Research Study with Palestinian Elementary Students**".

This tool is designed by the researcher as part of fulfilling her PhD thesis requirements and in order to achieve the overall aim of the study that is: investigating the impact of using online computers games in learning English vocabulary in Palestine. This questionnaire is revised and modified by the supervisor Dr. Raúl Ruiz Cecilia.

This questionnaire consists of two parts: the first part comprises personal data; whereas the second part includes the items of the questionnaire.

The researcher would be grateful if you answer the two parts appropriately in the provided space. Your answers will be kept strictly confidential and the given information will be used for research purposes. In case of queries, feel free to email the researcher on: Nidaa.zuhd@live.com .

Thank you for your cooperation,
The Researcher:
Nedaa Waleed Zohud

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The First Part: Personal Information

Please put the mark (X) in the place that suit your case:

1. Gender: a- Male (   )   b- Female   (   ) .

2. Age: a- Less than 25 years (   ) b- 26-35 years (   )
        c- 36- 46 years   (   ) d- More than 46 years (   )

3. Academic Qualification: a- Diploma   (   ) b- Bachelor (   )
                            c- Master   (   ) d- Others   (   ).

4. Professional Experience in Teaching English as a Foreign Language:
        a- Less than 5 years (   ) b- 5 – 10 years (   ) c- More than 10 years (   ).

5. School of Teaching: a- Private School (   )   b- State- run School (   )

6. Level Stage of teaching: a- Elementary classes (   ) b- Secondary classes (   )
                            C- Both of them   (   ).

7. Which classes do you teach?
…………………….

The Second Part:

This part consists of the questionnaire items, which are classified into three components:

1- **The First Component:** teachers' perspectives toward using online computer games in teaching English vocabulary.
2- **The Second Component**: students' attitudes towards using online computer games in learning English vocabulary.
3- **The Third Component:** the effect of online computer games on the learning of English vocabulary; with respect to gender and age.

The First Component: Teachers' perspectives toward using online computer games in teaching English vocabulary.

Please answer the following items by putting (X) in the box that best expresses your perspectives:

No.	Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Teaching vocabulary is the most important job for English teachers.					
2.	Teachers need to keep students active and interested to learn vocabulary.					
3.	Language learning is best when the focus is on something other than the language itself.					
4.	I prefer revising vocabulary using online games rather than worksheet.					
5.	I use online computer games in teaching English.					
6.	I believe that English teachers should use new ways in teaching vocabulary like online computer games.					
7.	I believe that Students will not learn more vocabulary if they play online games.					
8.	Teachers can attract students' attention in the elementary schools by using online computer games.					
9.	Using online games to revise vocabulary can help students to remember new words more easily.					
10.	I believe that online computer games not the appropriate technique in teaching vocabulary.					
11.	I believe that students work well in their groups through online computers games.					
12.	Students find learning English vocabulary as the most difficult tasks.					
13.	Palestinian students have problems in understanding the comprehension texts because they have problems in vocabulary.					

	The Second component: Students' attitudes towards using online computer games in learning English vocabulary					
14.	Online computer games stimulate students' interest in learning vocabulary.					
15.	Computer games encourage students to recall vocabulary.					
16.	Online computer games increase students' productivity in vocabulary.					
17.	Students prefer to learn English vocabulary by using online computers games.					
18.	Online computer games connect students with learning vocabulary at home.					
19.	Online computer games have a negative effect on students' proper learning of vocabulary.					
20.	Online computer games enable students to view and edit their answers easily.					
21.	Online computer games can motivate students into more active and interactive learning.					
22.	Online computer games enrich students' knowledge to use and learn vocabulary.					
23.	Online computer games improve students' ability to learn English vocabulary effectively.					
24.	Online computer games help shy students to participate.					
25.	Slow learners can learn better by using online computer games.					

3-	**The Third One:** The effect of online computer games on the learning of English vocabulary; with respect to gender and age.					
26.	The competences of female students' in learning English vocabulary is better than their male counterparts.					
27.	Female students will be more active in learning by online computer games.					
28.	Male students have access to online computers games more than females.					
29.	The availability of internet service centers and facilities are limited.					
30.	Male students will be more active in learning by online computer games.					
31.	The students' weaknesses in vocabulary can be partially solved by enabling them to use Online computer games.					
32.	Online computer games help students to be active and to learn by themselves.					
33.	The more the students' use the Online computer games, the better their English language will be.					

Vocabulary Exam

Name: **3rd Grade**

Class: **total mark: 40**

1) **Match the pictures with their meanings.**   **(4 m)**

River

Farmer

Elephant
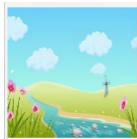
Carrot

2) Choose and write: **(5 m)**

Ice-cream	Swings	trousers	school	paint

1- I go to ------------at six o'clock .

2- Let's go on the ----------

3- you------------

4- They eat--------------

5- He's wearing--------------

3) Circle the odd words: **(4 m)**

1-Sunday	Monday	February	Friday
2-lunch	food	breakfast	dinner
3-one	three	thirteen	four
4-socks	boots	tracksuit	jeans

4) Match: (4 m)
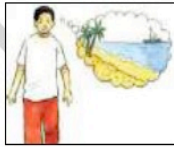
1. paint
2. dance dabka
3. go to the beach
4. go to bed

5) Circle: (4 m)

dance dabka	socks	draw pictures	hat
play music	tracksuit	show our work	dress
act in a play	trainers	play music	slippers

6) Write the missing letters: (b / sh / t / p/ ch) (5 m)

__layground   __elephone   __eese   __oulders   __utterfly

7) Choose: (5m)

270
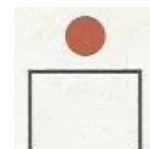
sit down	hop	house	on	open your hands
stand up	clap	school	under	close your hands

8) Look and answer.   **(2m)**

    1- What do you like doing?

    I like …………………

    2- What can you see?

    I can see a…………….

9) Read and color.   **(2 m)**

She has blonde hair and blue eyes

He has black hair and brown eyes.

Name: **3rd Grade**

Class: **total mark: 35**

**1) Match the pictures with their meanings.   (4 m)**

                                          Butterfly

                                          Trainers

                                          Shoulders

                                          Flag

---

2) Choose and write: **(5 m)**

Playground	telephone	cheese	slippers	swimming

1- My father has one ………………………

2- Cats like ………………………..……..

3- Ahmad likes………………………………

4- My …………………….. are very comfortable.

5- Children play in the ……………………...

3) Circle the odd words: **(4 m)**

1- Tomato	onion	garlic	banana
2- Six	two	twenty	four
3- Shoes	dress	shirt	T- shirt
4- Sunday	Monday	Tuesday	March

4) Match: **(4 m)**

Drawing picture
Stand up
Open your hand
Play music

5) Circle: **(4 m)**

Play music	go to the bed	do homework	paint
Draw pictures	go to the beach	go to the beach	sing
Dance dabka	eat cake	play music	write

10) Write the missing letters: **(R, S, E, F, C)**   **(5m)**
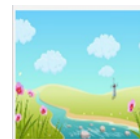
…..chool   ….lephant   …armer   …..iver
….arrot

6) Choose (5 m)

Swings	hotdog	trousers	bread	house
House	ice-cream	short	cheese	school
School	chocolate	T-shirt	chips	playground

7) Look and answer. (2m)

1- What is the child doing?
   He is ……………………………

2- Where is the ball?
   It is …………………………

8) Read and color. (2 m)

He has brown hair and green eyes

She has blonde hair and red mouth

The End

Appendix B

Online computer games program

The experiment details (B1)

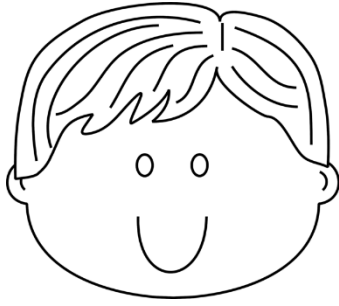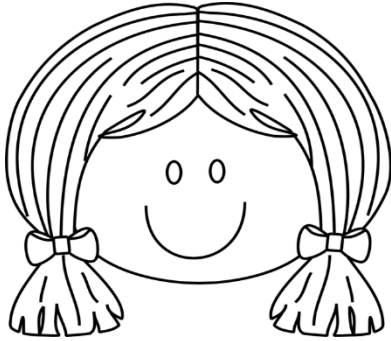| Days	time	classes	topics	weeks	groups
Sunday	11:25-12:05	3rd grade girls	Animals		control group
	12:10-12:50	3rd grade girls	Animals		experimental group
Wednesday	11:25-12:05	3rd grade girls	Animals		control group
	12:10-12:50	3rd grade girls	Animals		experimental group
				week 1	
Tuesday	8:40-9:25	3rd grade boys	Animals		control group
	9:30-10:10	3rd grade boys	Animals		experimental group
Thursday	8:40-9:25	3rd grade boys	Animals		control group
	9:30-10:10	3rd grade boys	Animals		experimental group
Sunday	11:25-12:05	3rd grade girls	Fruits		control group
	12:10-12:50	3rd grade girls	Fruits		experimental group
Wednesday	11:25-12:05	3rd grade girls	Fruits		control group
	12:10-12:50	3rd grade girls	Fruits		experimental group
				week 2	
Tuesday	8:40-9:25	3rd grade boys	Fruits		control group
	9:30-10:10	3rd grade boys	Fruits		experimental group
Thursday	8:40-9:25	3rd grade boys	Fruits		control group
	9:30-10:10	3rd grade boys	Fruits		experimental group
Sunday	11:25-12:05	3rd grade girls	vegetables		control group
	12:10-12:50	3rd grade girls	vegetables		experimental group
Wednesday	11:25-12:05	3rd grade girls	vegetables		control group
	12:10-12:50	3rd grade girls	vegetables	week 3	experimental group
Tuesday	8:40-9:25	3rd grade boys	vegetables		control group
	9:30-10:10	3rd grade boys	vegetables		experimental group

Thursday	8:40-9:25	3rd grade boys	vegetables		control group
	9:30-10:10	3rd grade boys	vegetables		experimental group
Sunday	11:25-12:05	3rd grade girls	Food		control group
	12:10-12:50	3rd grade girls	Food		experimental group
Wednesday	11:25-12:05	3rd grade girls	Food		control group
	12:10-12:50	3rd grade girls	Food		experimental group
				week 4	
Tuesday	8:40-9:25	3rd grade boys	food		control group
	9:30-10:10	3rd grade boys	food		experimental group
Thursday	8:40-9:25	3rd grade boys	food		control group
	9:30-10:10	3rd grade boys	food		experimental group
Sunday	11:25-12:05	3rd grade girls	revision		control group
	12:10-12:50	3rd grade girls	revision by online computer games		experimental group
Wednesday	11:25-12:05	3rd grade girls	colors		control group
	12:10-12:50	3rd grade girls	colors		experimental group
				week 5	
Tuesday	8:40-9:25	3rd grade boys	revision by online games		control group
	9:30-10:10	3rd grade boys	revision		experimental group
Thursday	8:40-9:25	3rd grade boys	colors		control group
	9:30-10:10	3rd grade boys	colors		experimental group
Sunday	11:25-12:05	3rd grade girls	jobs		control group
	12:10-12:50	3rd grade girls	jobs		experimental group
Wednesday	11:25-12:05	3rd grade girls	jobs		control group
	12:10-12:50	3rd grade girls	jobs		experimental group
				week 6	
Tuesday	8:40-9:25	3rd grade boys	jobs		control group
	9:30-10:10	3rd grade boys	jobs		experimental group
Thursday	8:40-9:25	3rd grade boys	jobs		control group
	9:30-10:10	3rd grade boys	jobs		experimental group

Sunday	11:25-12:05	3rd grade girls	clothes		control group
	12:10-12:50	3rd grade girls	clothes		experimental group
Wednesday	11:25-12:05	3rd grade girls	clothes		control group
	12:10-12:50	3rd grade girls	clothes	week 7	experimental group
Tuesday	8:40-9:25	3rd grade boys	clothes		control group
	9:30-10:10	3rd grade boys	clothes		experimental group
Thursday	8:40-9:25	3rd grade boys	clothes		control group
	9:30-10:10	3rd grade boys	clothes		experimental group
Sunday	11:25-12:05	3rd grade girls	numbers		control group
	12:10-12:50	3rd grade girls	numbers		experimental group
Wednesday	11:25-12:05	3rd grade girls	numbers		control group
	12:10-12:50	3rd grade girls	numbers	week 8	experimental group
Tuesday	8:40-9:25	3rd grade boys	numbers		control group
	9:30-10:10	3rd grade boys	numbers		experimental group
Thursday	8:40-9:25	3rd grade boys	numbers		control group
	9:30-10:10	3rd grade boys	numbers		experimental group
Sunday	11:25-12:05	3rd grade girls	revision		control group
	12:10-12:50	3rd grade girls	revision by online computer games		experimental group
Wednesday	11:25-12:05	3rd grade girls	prepositions		control group
	12:10-12:50	3rd grade girls	prepositions		experimental group
				week 9	
Tuesday	8:40-9:25	3rd grade boys	revision		control group
	9:30-10:10	3rd grade boys	revision by online computer games		experimental group
Thursday	8:40-9:25	3rd grade boys	prepositions		control group
	9:30-10:10	3rd grade boys	prepositions		experimental group
Sunday	11:25-12:05	3rd grade girls	body parts		control group
	12:10-12:50	3rd grade girls	body parts	week 10	experimental group

Wednesday	11:25-12:05	3rd grade girls	body parts		control group
	12:10-12:50	3rd grade girls	body parts		experimental group
Tuesday	8:40-9:25	3rd grade boys	body parts		control group
	9:30-10:10	3rd grade boys	body parts		experimental group
Thursday	8:40-9:25	3rd grade boys	prepositions		control group
	9:30-10:10	3rd grade boys	prepositions		experimental group
Sunday	11:25-12:05	3rd grade girls	transportation		control group
	12:10-12:50	3rd grade girls	transportation		experimental group
Wednesday	11:25-12:05	3rd grade girls	transportation		control group
	12:10-12:50	3rd grade girls	transportation		experimental group
				week 11	
Tuesday	8:40-9:25	3rd grade boys	transportation		control group
	9:30-10:10	3rd grade boys	transportation		experimental group
Thursday	8:40-9:25	3rd grade boys	transportation		control group
	9:30-10:10	3rd grade boys	transportation		experimental group
Sunday	11:25-12:05	3rd grade girls	Sports		control group
	12:10-12:50	3rd grade girls	Sports		experimental group
Wednesday	11:25-12:05	3rd grade girls	time		control group
	12:10-12:50	3rd grade girls	time		experimental group
				week 12	
Tuesday	8:40-9:25	3rd grade boys	sports		control group
	9:30-10:10	3rd grade boys	sports		experimental group
Thursday	8:40-9:25	3rd grade boys	time		control group
	9:30-10:10	3rd grade boys	time		experimental group

Online Computer games (B2)

1. Animals
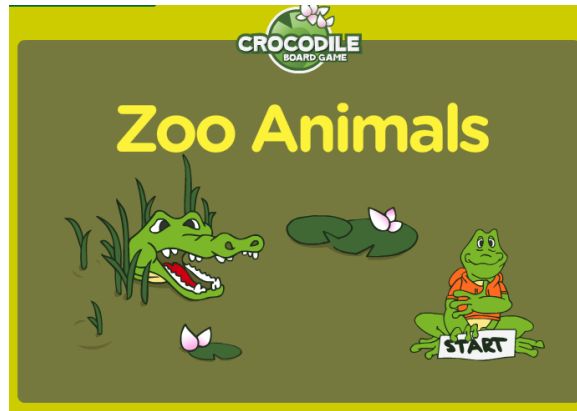
2. Fruits
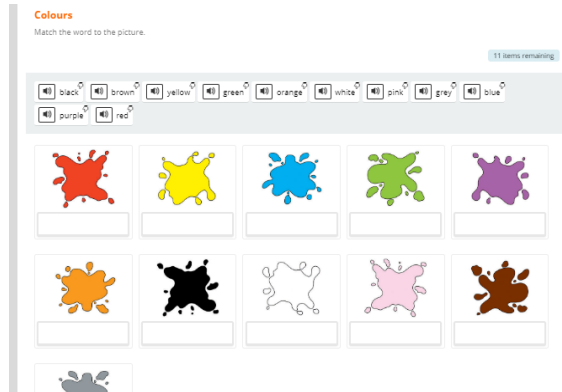

3. Vegetables

4. Food
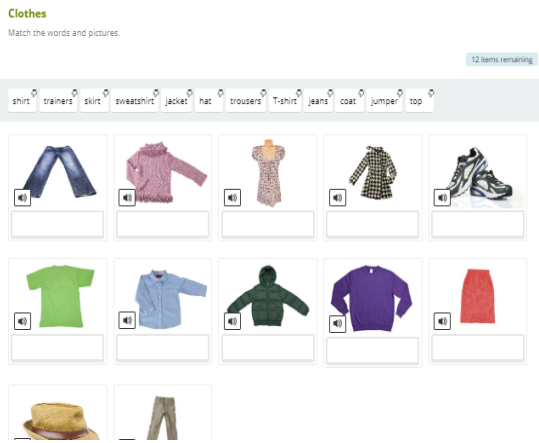

5. Colors

6. Jobs

7. Clothes
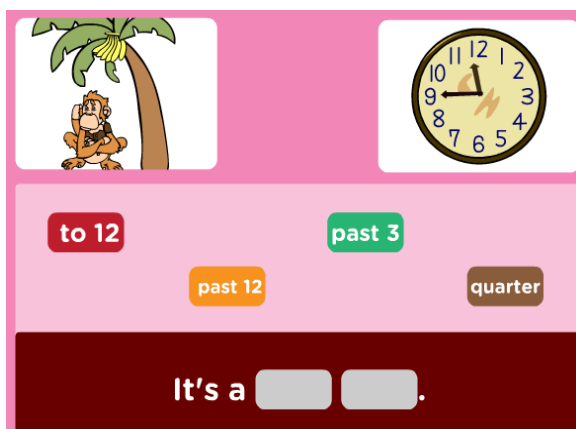

8. Numbers

9. Transportation

10. Body parts
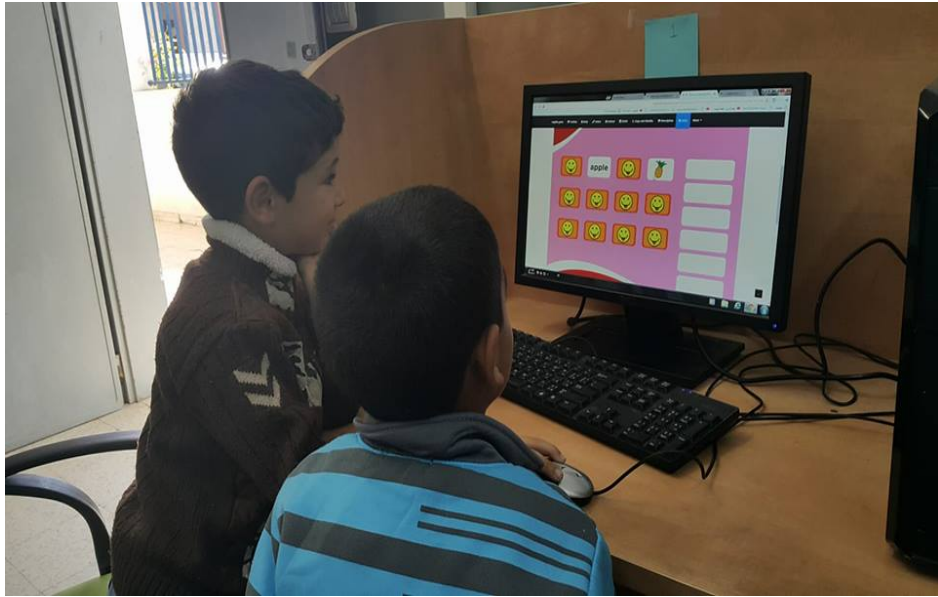

11. Sports

12. Time

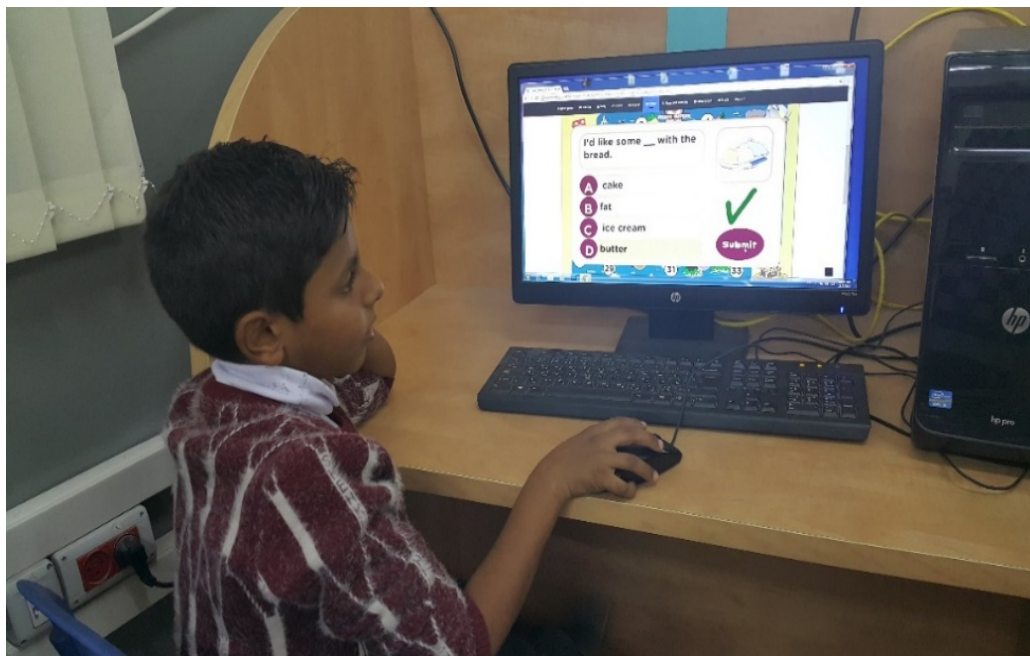For more games:

Appendix (C)

Pictures of the project

Appendix (D)

Letters of Permission

Universidad de Granada

Departamento de Didáctica de la Lengua
y la Literatura

July 27, 2017

The Palestinian Minister of Education

The Palestinian Ministry of Higher Education

Fax: 00972-2-2983222

Ramallah-Palestine

To Whom It May Concern

This is to certify that Ms. **Nedaa Waleed Izzat Zohud**, with ID 3861835 is a Ph.D student in educational sciences at the university of Granada and she is doing a doctoral dissertation entitled "**Incidental Learning of English Vocabulary through Online Computer Games: A Research Study with Palestinian Elementary Students**".

Please, help her to do the experimental study and to distribute the questionnaires among English teachers at Salfit district.

Sincerely yours,

Fdo.: Raul Ruiz Cecilia
Director del Departamento
Didáctica de la
Lengua y la Literatura

Departamento de Didáctica de la Lengua y la Literatura
Facultad de Ciencias de la Educación

Campus Universitario de Cartuja, s/n
18071 Granada
Tlf. 958 243 965
Fax 958 244 187
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State of Palestine
Ministry of Education & Higher Education
Educational Research & Development Center

دولة فلسطين
وزارة التربية والتعليم العالي
مركز البحث والتطوير التربوي

الرقم: ٤ / ٤٦ / ١٢٤١٥

التاريخ: 2017/8/23

الموافق: ١ / ١٢ / 1438 هـ

السيد مدير التربية والتعليم المحترم

سلفيت

تحية طيبة وبعد،،

الموضوع: تسهيل مهمة بحثية

نهديكم أطيب التحيات، ونرجو التكرم مع التعاون مع الباحثة: نداء وليد زهد، لاستكمال حصولها على شهادة الدكتوراه من جامعة غرناطة في إسبانيا، وتنفيذ أطروحتها بعنوان" **التعلم العرضي للمفردات الإنجليزية من خلال ألعاب الحاسوب عبر الإنترنت: دراسة بحثية لطلبة المرحلة الأساسية الفلسطينية.**

Incedintal Learning of English Vocabulary through Online Computer Games: A Research Study with Palestinian Elementary Students" وتمكينها من تنفيذ أدوات الدراسة التجريبية المعدة لهذه الغاية في عينة مختارة من مدارس مديريتكم، وستقوم أيضاً بتوزيع استبانة على عينة عشوائية من معلمي اللغة الإنجليزية في المديرية وبما لا يؤثر على سير العملية الإدارية والتعليمية.

مع الإحترام والتقدير

د. إيهاب شكري

المكلف بمركز البحث والتطوير التربوي

نسخة :

معالي وزير التربية والتعليم العالي المحترم

عطوفة السيد وكيل الوزارة المحترم

عطوفة الوكيل المساعد للتخطيط والتطوير المحترم

Dr. Raul Cecilia/ Director of Education Departement at Univisrsity of Granada

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