



Hellenic Open University

School of Humanities

Postgraduate Course

Postgraduate Dissertation

A CASE STUDY ON TEENAGE VOCABULARY
ACQUISITION AND RETENTION WITH THE USE OF
MASSIVELY MULTIPLAYER ONLINE GAMES

Christina Tseliou

Supervisor: Evangelia Karagianni

Patras, Greece, June, 2022

Theses / Dissertations remain the intellectual property of students (“authors/creators”), but in the context of open access policy they grant to the HOU a non-exclusive license to use the right of reproduction, customisation, public lending, presentation to an audience and digital dissemination thereof internationally, in electronic form and by any means for teaching and research purposes, for no fee and throughout the duration of intellectual property rights. Free access to the full text for studying and reading does not in any way mean that the author/creator shall allocate his/her intellectual property rights, nor shall he/she allow the reproduction, republication, copy, storage, sale, commercial use, transmission, distribution, publication, execution, downloading, uploading, translating, modifying in any way, of any part or summary of the dissertation, without the explicit prior written consent of the author/creator. Creators retain all their moral and property rights.



A CASE STUDY ON TEENAGE VOCABULARY
ACQUISITION AND RETENTION WITH THE USE OF
MASSIVELY MULTIPLAYER ONLINE GAMES

Christina Tseliou

Supervising Committee

Supervisor:

Dr Evangelia Karagianni
Hellenic Open University

Co-Supervisor:

Dr Georgios Damaskinidis
Hellenic Open University

Patras, Greece, June, 2022

*“To my beloved husband for his patience and support during this journey and to my
thoughtful parents for their unconditional love.”*

Abstract

Digital games are frequently condemned by parents and adults in general. However, when used moderately they can be beneficial and contribute to learning in a natural way. To this end, researchers' attention towards the educational value of technology has increased. Their focus, however, was mainly directed towards the use of digital games within the school environment as an additional tool in teachers' hands that could either enhance their students' knowledge through practice or as an entertaining way to revise material that has already been taught.

This study attempts to investigate the effectiveness of commercial massively multiplayer online games (MMOGs) played in a non-formal educational setting in vocabulary development and retention in a naturalistic environment. More specifically, its aim is to explore and provide answers to questions related to the extent to which these games can contribute to vocabulary enhancement as well as retention and the techniques that are used while playing in order to achieve vocabulary acquisition. For that reason, the research conducted was a case study and the subject of the study is a teenage boy in the first year of Junior High School. Additionally, the participant is an English as a Foreign Language (EFL) learner of B2 level based on the Common European Framework (CEFR) for languages scheme of proficiency levels. During the study qualitative data was collected and analyzed. The selected methods for the collection of data were a semi-structured interview and observations in an attempt to compare and contrast the results in order to triangulate and verify the original hypothesis. According to the findings vocabulary can be developed and retained effectively without the assistance and guidance of a teacher. Furthermore, a variety of different techniques affected and were used both for meaning derivation and for the storage of new vocabulary in the participant's long and short-term memory, promoting autonomy and motivation. Undoubtedly, further investigation is necessary to understand how MMOGs could be used as a teaching supplement in a formal educational setting.

Keywords

Digital games, vocabulary acquisition, teenagers, memory, cooperation

Μελέτη Περίπτωσης Σχετικά με τον Εμπλουτισμό του Λεξιλογίου των Εφήβων Μέσα Από τη Χρήση Μαζικών Διαδικτυακών Παιχνιδιών Πολλαπλών Παικτών

Χριστίνα Τσέλιου

Περίληψη

Τα ηλεκτρονικά παιχνίδια αντιμετωπίζονται συχνά με δυσπιστία από γονείς και εν γένει ενηλίκους. Παρόλα αυτά η συμβολή και η αξία τους στην εκπαίδευση μπορεί να αποδειχθεί πολύτιμη εάν χρησιμοποιηθούν με σύνεση. Γι' αυτό το λόγο το ενδιαφέρον των ερευνητών σχετικά με την εκπαιδευτική αξία της τεχνολογίας ολοένα και αυξάνεται. Το ενδιαφέρον των ερευνών, όμως, έχει επικεντρωθεί στη χρήση των ηλεκτρονικών παιχνιδιών μέσα στο σχολικό περιβάλλον ως εργαλεία που οι εκπαιδευτικοί μπορούν να χρησιμοποιήσουν είτε για τον εμπλουτισμό των γνώσεων των μαθητών τους είτε ως ένας ευχάριστος τρόπος οι μαθητές να κάνουν επανάληψη όσων έχουν ήδη διδαχθεί.

Η μελέτη αυτή αποτελεί ένα εγχείρημα σκοπός του οποίου είναι να ερευνήσει κατά πόσο τα μαζικά διαδικτυακά παιχνίδια πολλαπλών παικτών (MMOGs) που παίζονται σε ένα πλαίσιο εκτός του σχολικού συστήματος μπορούν να συνεισφέρουν στον εμπλουτισμό και τη συγκράτηση λεξιλογίου. Πιο συγκεκριμένα, σκοπός της είναι να ερευνήσει και να προσφέρει απαντήσεις σε ερωτήματα που σχετίζονται όχι μόνο με το κατά πόσο αυτού του είδους παιχνίδια μπορούν συμβάλλουν στον εμπλουτισμό και τη συγκράτηση λεξιλογίου αλλά και στο ποιες τεχνικές χρησιμοποιούνται για την εκμάθηση λεξιλογίου κατά τη διάρκεια του παιχνιδιού. Γι' αυτό το σκοπό σχεδιάστηκε μια μελέτη περίπτωσης, το υποκείμενο της οποίας είναι ένα έφηβο αγόρι της Α' Γυμνασίου. Επιπροσθέτως, ο

συμμετέχων στην έρευνα είναι μαθητής Αγγλικής γλώσσας επιπέδου B2 σύμφωνα με τα επίπεδα γλωσσικής ικανότητας του CERF. Κατά τη διάρκεια της έρευνας συνελέχθησαν και αναλύθηκαν ποιοτικά δεδομένα. Ως μέθοδοι συλλογής δεδομένων χρησιμοποιήθηκαν μια ημιδομημένη συνέντευξη και παρατήρηση σε μια προσπάθεια να συγκριθούν τα δεδομένα έτσι ώστε να επιβεβαιωθεί ή να απορριφθεί η αρχική υπόθεση. Σύμφωνα με αυτά τα αποτελέσματα, το λεξιλόγιο μπορεί τόσο να εμπλουτιστεί όσο και να συγκρατηθεί ακόμα και χωρίς τη βοήθεια ή την καθοδήγηση ενός δασκάλου. Επιπλέον, μια ποικιλία από διαφορετικές τεχνικές χρησιμοποιήθηκαν προκειμένου να γίνει κατανοητή η σημασία νέου λεξιλογίου και να αποθηκευθεί στη βραχυπρόθεσμη και τη μακροπρόθεσμη μνήμη του συμμετέχοντα. Με αυτό τον τρόπο ενισχύθηκε το αίσθημα μαθησιακής ανεξαρτησίας και τα κίνητρα προκειμένου να συνεχίσει να προσπαθεί παρά τις δυσκολίες που συναντούσε.

Λέξεις – Κλειδιά

Ηλεκτρονικά παιχνίδια, εκμάθηση λεξιλογίου, έφηβοι, μνήμη, συνεργασία.

Table of Contents

Abstract	v
Περίληψη.....	vi
Table of Contents	viii
List of Abbreviations & Acronyms	x
Introduction	1
1. Game Trends and their Use in Contemporary Education	3
1.1 Introduction	3
1.2 Understanding Games, their Characteristics and Learning Benefits	3
1.3 Digital games and their subcategories	5
1.3.1 Video and Computer Games	5
1.3.2 Online Games	7
1.4 Edutainment, Gamification and Digital Game-Based Learning	8
1.5 Conclusion.....	11
2. Linguistic, Emotional and Cognitive Functions of Games in Foreign Language Learning	12
2.1 Introduction	12
2.2 Foreign Language Learning Theories in Games and Incidental Learning.....	12
2.3 Emotional and Cognitive Functions and their Relationship to Games	14
2.3.1 Identifying the Different Types of Motivation.....	16
2.3.2 Collaboration and Interaction.....	16
2.3.3 The Different Types of Memory and its Connection to Emotions.....	17
2.4 Vocabulary Learning and Games	18
2.5 Conclusion.....	20
3. The Research Design.....	21
3.1 Introduction	21
3.2 Research Questions	21
3.3 The Rational Behind the Qualitative Research	22
3.4 The Research Method	23
3.5 Tools Used for Data Collection.....	24
3.5.1 The Semi-Structured Interview	25
3.5.2 The Observation	26
3.6 The Participant’s Profile	27
3.7 Analysis of the Collected Data Using the Method of Interpretative Phenomenological Analysis	28
3.8 Conclusion.....	29
4. The Research Results	30
4.1 Introduction	30
4.2 Presentation and Discussion of the Semi-Structured Interview Findings	30
4.3 Observation’s Presentation and Discussion	32
4.4 Conclusion.....	37
5. Implications of the Study and Future Research	38
5.1 Introduction	38
5.2 Research Questions Overview	38

5.3 Implications of the Present Study	41
5.4 Limitations and Proposals for Further Research	41
5.5 Conclusion.....	42
Concluding Remarks	43
References	44
Appendix 1: Written Consent	66
Appendix 2: The Semi-Structured Interview	67
Appendix 3: Observation Predetermined Aspects	73
Appendix 4: Observation Comprehensive Notes	76

List of Abbreviations & Acronyms

CALL: Computer Assisted Language Learning

CERF: Common European Framework

DGBL: Digital Game Based Learning

EFL: English as a Foreign Language

HUD: Heads up Display

IPA: Interpretative Phenomenological Analysis

L1: Native Language

L2: Second Language

MMOFPS: Massively Multiplayer Online First-Person Shooter Games

MMOGs: Massively Multiplayer Online Games

MMORPGs: Massively Multiplayer Online Role-Play Games

MMORTS: Massively Multiplayer Online Real-Time Strategy Games

Introduction

Admittedly more and more young people and especially teenagers are choosing digital games for their entertainment nowadays. Traditional games like hide and seek or board games have been replaced by consoles and computers. The combination of visuals, audio and virtual reality that the digital world has to offer seems to increasingly attract teenagers' interest. However, digital and video games are not a contemporary trend. Nobody can claim to have forgotten Atari consoles released on the market in 1977. Back then this type of gaming might have been regarded as an alternative and maybe secondary form of entertainment. Modern teenagers, though, might more easily be regarded as citizens of the world and as such they may desire to communicate with other people on an international level, learning about new cultures and lifestyles and not being confined within the limits of the city or village they live in. For that to be achieved, players need to be able to communicate using the same language, which is English.

For all the above mentioned reasons researchers have been increasingly concerned about whether being exposed to digital games can have an impact on English language learning in general and on what aspects of the language in particular. Nowadays, digital games can be used as a source for active language interaction since they have developed more sophisticated gameplay and story compared to the past (Rudi's & Poštić, 2018). Communication, additionally, among co-players may be one of the key elements of the gameplay that can potentially contribute to the increase of non-native English speakers' proficiency. Therefore, the present dissertation aims to examine whether playing can lead to teenagers' vocabulary acquisition and whether this vocabulary can be retained.

To this end, in the first chapter a literature review is presented providing readers with the theoretical basis on what constitutes a game and on the educational benefits that playing can have. Exploring the different kinds and aspects of digital games and the different educational trends focusing on the use of these games attempts to offer a better insight on how they can be used as a tool by both teachers and students not only inside, but also outside formal educational settings. In the second chapter the focus is directed towards the connection between games and language acquisition. The characteristics and teaching

practices of the different language learning theories are examined while special attention is paid to incidental language learning especially in non-formal, out-of-school learning settings. Emphasis is given on linguistic, emotional and cognitive aspects of playing a game. Chapter 3 refers to the way the qualitative research study was designed and conducted. Its aim is to outline the case study's research questions and the methodology adopted along with the selected instruments for data collection, which are a semi-structured interview and observations. The participant's profile is also presented in this chapter as well as the method of analysis of the collected data. As far as the actual research findings are concerned, they are described and discussed in Chapter 4. The findings from the semi-structure interview are presented first and what follows is the discussion of the observations' findings. Chapter 5 is devoted to the answering of the research questions, which are related to vocabulary acquisition as well as retention while playing MMOGs in an informal educational setting and the techniques used for meaning derivation. Additionally, the limitations of the study, its implications and suggestions for further research in these areas are attempted in this chapter.

1. Game Trends and their Use in Contemporary Education

1.1 Introduction

Teenagers start engaging in playful activities which involve one or more players from a very young age. Playing games is an activity they choose for its own sake and not because of some underlying, hidden reasons behind it (Fabricatore, 2000). The game environment is a simulated reality of their everyday life where they can experience and imagine multiple situations whether they have already experienced them or not. Many attempts have been made to provide a single, all-inclusive definition of games over the years without success though, because of the vast boundaries of games and the risk of oversimplification (Mäyrä, 2008). In this chapter and for the purpose of the present study a definition of games will be presented, followed by a summary of the games' characteristics and learning benefits. Then a description of digital games and their subcategories (computer, video and online games) will follow in order to better understand their nature and characteristics and make the connection between them and the new learning trends and potentials that have arisen as a result.

1.2 Understanding Games, their Characteristics and Learning Benefits

In the present study games will be perceived as an entertaining, interesting and voluntarily chosen pastime. This pastime is followed by a set of rules and constraints which explain what is allowed and what is not during the gameplay. While playing, players should feel a sense of enjoyment which derives mainly from the element of surprise and excitement. Every game is interactive and designed around specific objectives that need to be achieved. In this way, players' competitiveness is raised exposing them to a challenging environment. It is through this environment that creativity, decision making and problem-solution skills are promoted in order to test and revise players' skills and strategies.

Undoubtedly, there are many kinds of games available on the market sharing a number of similar characteristics. What is important, though, is their educational value. Playing a game does not necessarily signify learning, as in some cases this might not be succeeded. That is the reason why it is important to identify those characteristics that would make a

game a valuable learning tool and the educational benefits teenagers can enjoy while playing.

One of those characteristics is that they are highly competitive and expose players to challenges that need to be overcome. For this to be accomplished they are constantly engaged into a process of setting short and long term goals that need to be achieved and completely devote themselves to them (Resnick, 2004). As a result, players quite often lose sense of time and completely dedicate themselves to the gameplay, where they come across sophisticated practices (Steinkuehler, Squire & Barab, 2012). These practices require a set of skills to be understood and mastered on the one hand and new things to be learnt on the other (Gee, 2007). However, this is not the reason why they choose to play. On the contrary, they do not think about the benefits and the skills they might need or be able to master at all, as in some cases these are not clear or immediate. Their main concern is to achieve the games' objectives and the positive affection that comes as a result, that is pleasure and enjoyment (Smith, 2010). What happens while playing according to Bekoff & Byers (1998) is that information is subconsciously discriminated to relevant and irrelevant, better filtering what is to be learnt or mastered. Additionally, thoughts and feelings are better organized and monitored and attention is increased. In that way, learning turns into an ongoing, relaxing, subconscious process during which players do not realize the amount of thought they give on new knowledge (Brown & Vaughan, 2009).

Another characteristic games and playful activities in general share is that they offer players the opportunity to be part of a small community and to socialize (Wolf, 2012). Socialization and cooperation are claimed to motivate people to better understand themselves and raise their self-esteem through constant self enhancement, positive behaviour and assessment for the benefit of the group (Ashforth & Mael, 1989) (see section 2.3.2) In this environment players learn to work as a unit which combines each member's strengths, negotiate and share while being innovative and productive in order to reach the peak of their potentials (Singer et al., 2006). Through creativity and innovation, they exercise their imagination, develop their emotional intelligence while learning about the different kinds of acceptable behaviours. Thus, they learn how to manage their feelings either positive or negative ones and test their abilities taking risks and figuring out

different ways to do things (Reasons why socializing and play is important for children, 2020).

1.3 Digital games and their subcategories

In the previous section an attempt was made to present the characteristics of games and the learning benefits that can derive from playing. Technological evolution, however, signified the progress of digital technologies, which are present in almost all aspects of our daily life, and has led to the creation of new and the improvement of the already existing software and hardware. This of course has affected the area of games in general and digital games in particular, creating new game genres (Fromme & Unger, 2012).

This section seeks to explore digital games and their subcategories in order to provide a better insight and identify similarities and differences between traditional and digital games as far as their characteristics are concerned and their potential learning benefits. According to Kerr's (2006) definition, digital games are the games that can be played on any mobile device whether this is a computer, a laptop, a console, a handheld device, a mobile phone or the Internet. Digital games are designed, produced and distributed using digital technologies, offering players the benefit of playing the game of their choice whenever and wherever they wish. As a result, it is easier for the games to be adapted, transferred and used from one platform to the other. For this reason, in the present study computer and video games as well as online games will be considered as subcategories of the field of digital games

1.3.1 Video and Computer Games

It is believed that nowadays the terms computer and video games are interchangeable and that they belong under the umbrella term digital games. This is not surprising if someone considers the fact that nowadays both computer and video games can be played in either device. That is the reason why for some decades there has been confusion and vagueness on the differences between the two types of games making the distinction hard.

During the 1970s and 1980s the main difference between the two was that computer games could be played on computers only and video games on consoles (Mitchell &

Savill-Smith, 2004). However, this is where their differences stopped and their common characteristics began. First and foremost, both game types are software played by a human who interacts with computer-controlled characters (Tamborini & Skalski, 2006). They are simulations that appear on a screen, making the traditional concept of games part of the digital world (Günzel, 2012). Computer and video game players are exposed to images and objects with which they have to interact, something that differentiates them from films or other motionless images (Fromme & Unger, 2012). This interaction allows players to alter or adapt the content and the form of the game environment according to their preference or for the purpose of the game and respond to the stimuli employed in real time (Steuer, 1992). They are given the power to control the game's properties and functions to a certain extent, so as to better master it and reduce the sense of cognitive regret in case of low performance or defeat (King et al., 2009). More specifically, it allows players to save progress at any point they want in order to continue it later and permits them to replay levels as many times as possible to correct their mistakes and fully master the skills necessary to achieve the level's objectives and move on to the next level. Accomplishing a level could be considered a form of assessment, but it is not the only one. According to King et al. (2009), the majority of video and computer games have some sort of heads up display (HUD) showing players' resources (health, weapons, magic spells etc). These resources and the way they are managed could be claimed to be a form of assessment on the players' performance, rewarding or punishing them through the increase or decrease of their resources or experience points during the gameplay.

Technological evolution, though, and especially the increasing use of the Internet and network technology have brought changes in computer and video games. Since the early 2000s computer and video game distribution has changed and game developers gradually realized the need for mobile gaming (Egenfeldt-Nielsen et al., 2013). As a result "app stores" and platforms, where players can download the games they want to play, were initiated into the computer and video game industry. Players no longer need to buy CD-ROM versions suitable for either computers or consoles. Instead, they can download games in any device and start playing either online or offline.

1.3.2 Online Games

The already mentioned need for mobile gaming and the increasing use of the Internet set the ground for the extension of video and computer games to the browser game format, creating what is known as online games (Chew, 2015). That is the reason why online game platforms are able to run video and computer games, where the only thing an online game player has to do before they start playing is to log into their account in any device (consoles, portable devices and personal computers) enjoying easy access to the game (Khatri, 2018). It could be assumed that all these indicate that the three game types belong to the field of computerized game playing and that they share many characteristics with online games being the advancement of both video and computer games.

What differentiates online games, though, from the other types is not the need for internet connection, but the highly competitive, artificial, multi-player, collaborative and interactive environment they engage players in, ensuring their involvement and offering them a more intense experience (Weibel et al, 2008). One of the most popular online game genres is MMOGs, which can be further divided into three types; the massively multiplayer online role-play games (MMORPGs), the massively multiplayer online first-person shooter games (MMOFPS) and the massively multiplayer online real-time strategy games (MMORTS) (Ghuman & Griffiths, 2012). The main difference between the three types lies on the focus and objectives of the games (Nagygyörgy et al., 2013). More specifically, in MMORPGs the focus is directed on the designed character and its selected skills that define its role within the game environment. In MMOFPS the focus is on the players' skills as far as the time of reaction and attention are concerned and in MMORTS the focus is on troops' coordination, alliances and development of specialty areas. The distinction between the types might seem clear and easy to understand, but nowadays features and elements of one type are integrated into the others, constantly creating whole new game types and making labelling seem useless. For this reason, this study focuses on all three types which will be referred to as MMOGs since our research addresses to teenagers who choose the games they want to play during their free time according to their preferences and interests.

According to Badrinarayanan et al. (2015), what one needs to play MMOGs is to access the game's website in one of the multiple servers offered, regardless of time or place.

These games are designed around everyday, science fiction and imaginary situations and contexts in a complex, graphically rich virtual environment, where virtual characters' actions are controlled by humans who assume roles and not by computers. A player is allowed to select the game environment that better suits their objectives at different times, giving them the privilege of full independence, control of the game environment and a sense of satisfaction and autonomy. More specifically, they can choose to play solo or against other players in either a small or large group. This allows social features to emerge within the game environment, where players are able to form and participate in either randomly selected or "designed" teams cooperating for a common goal, to chat and join social groups (Tamborini & Skalski, 2006). The "designed" teams could either consist of players who have met and become friends within the game environment or of players who are friends or family in real life (Cole & Griffiths, 2007). Another characteristic of MMOGs is that they are on-going and do not stop after one player decides to exit the game for long or short periods of time (Jung et al., 2014). This means that the story of the games continues to evolve as other players continue playing. So, it could be assumed that in reality there is no final level to be reached in order to win a game of that kind, something that makes it a never-ending process.

1.4 Edutainment, Gamification and Digital Game-Based Learning

Games have been attracting an increasing interest in the field of education and family life in an attempt to promote and encourage learning of what is perceived as "good" and acceptable behaviour in an entertaining way with the use of reward systems. The same approach is adopted by the field of games as well, leading many game designers to the design of games with potential educational values.

The ideology behind this attempt, despite the criticism it faced, was that educational games would facilitate and promote learning something that led to the movement of edutainment in the early 1970s. This movement suggests a hybrid of entertainment and education with the use of audio-visual material (de Byl & Hooper, 2013) in an interactive environment. This will attract players' attention, retain their attraction through feelings of enthusiasm and excitement and will equip them with all the resources and methods necessary to initiate and facilitate a more permanent, subconscious learning (Aksakal, 2015; Osterweil & Klopfer, 2011). As a result, edutainment is totally disengaged from the

educational and learning experiences as well as the formal academic standards as they are widely accepted. In this environment, players participate actively in topics and themes that respond to their interests, background knowledge and experiences making use of their problem-solving and intellectual skills while being creative. Nowadays, technology's universality offers players the opportunity to be exposed to authentic language context improving their linguistic competence and higher order thinking with the creation of mental representations and negotiation of the multiple interpretations of the messages received (Iwasaki, 2009).

Despite the promising argumentation in favour of edutainment, many opposing and contradictory researches have condemned edutainment as untrustworthy and time consuming as far as the accomplishment of learning objectives are concerned (Li et al., 2013; Whitton, 2010). According to them despite the potential benefits, it cannot be trusted or guaranteed that knowledge acquired through educational games will be transferred and integrated to player's real life. The main reason is that playing is at the forefront, whereas learning becomes subordinate, leading to some if not no integration of play and learning experience (Egenfeldt-Nielsen, 2007). The players are engaged into a process of drilling and practicing where mechanic operations are performed that are time consuming and might fail to account for deep understanding of content or skill. Additionally, most of the relevant research on edutainment throughout the years has been focusing on formal educational setting, neglecting other informal or unstructured educational settings like private institutions or pastimes (de Freitas & Maharg, 2011). This lack of research on outside formal educational settings signifies the need for this research.

Based on the edutainment movement and despite its controversy, two new approaches have made their appearance recently. The first one is gamification and the second one is (digital) game based learning (Jayasinghe & Dharmaratne, 2013). Getting a deeper understanding of these new trends and the uses of games they suggest will be of help for the present study.

Gamification refers to gameful experiences that make use of game design elements and techniques applied to game irrelevant settings and contexts (Walz & Deterding, 2016). According to Balducci & Grana (2017) play and learn are interconnected and it is through

playing that experience is gained. So, what needs to be done is to transform an everyday task into a playful activity in order to teach and learn how to manage different tasks. Gamification's main goal is to ensure players' engagement, commitment and above all motivation (see Section 2.3.1) through a reward system that breaks the monotony and dullness of repetitive actions, encouraging players to continue playing and further explore (Ramirez & Squire, 2015). Thus, their persistence and effort are "praised" and acknowledged. Moreover, their confidence is increased, countermanding the belief that success and achievement are linked to talent, following the principles of incremental theory of intelligence (Dweck & Molden, 2005). In that way, everybody's engagement is ensured in an alternative, novel way that matches and responds to many different learning styles (Rice, 2009), setting aside traditional teaching pedagogies like lectures (de Byl, & Hooper, 2013). Through gamification players are able to identify their strengths and weaknesses in an indirect way that can change their attitudes towards learning and even promote it (Landers, 2014).

The second approach is that of digital game-based learning (DGBL) in which Computer-assisted Language Learning (CALL) aids and mainly multimodality and the variety of communicative media digital games encompass are used to support teaching and learning (Spires, 2015). DGBL promotes autonomy since there is no teacher to instruct, guide or lecture players before they perform any tasks, camouflaging the teaching-learning process with what has been called "stealth teaching" or "stealth guidance" (Bopp, 2006) which provides players with tutorials, labelling and exploration as part of the game. This might offer the benefit of practical skills, actions and steps followed at earlier stages either subconsciously or as part of the gameplay to come to the forefront and be reapplied, allowing players to learn by doing easing in that way the learning process in a learner-centred environment.

This leads to the assumption that in DGBL knowledge is acquired in a natural, experiential and even unnoticeable way in a virtual player interaction environment. In this environment, role playing and simulations are the main features, achieving what is known as knowledge transparency (Wang & Burton, 2010). Whenever difficulties or hindrances occur in such an environment, players seek for their virtual or real friends' assistance, advice and feedback promoting learning among peers and maintaining social contact and

interaction (Fields & Kafai, 2009). This increases motivation and flow (Dev, 1997) changing attitudes as far as the learning experience is concerned into more positive ones and ensures willing engagement and concentration on a pleasant activity which makes players lose sense of time (Hwank, Wu & Chen, 2012), practise, fail and repeat in order to accomplish their goals. Through extensive repetition players are able to practice and experiment with their new skills and knowledge a number of times so as to achieve the assigned tasks and complete the quests in a tranquil state of mind without being intimidated from time frames or a potential failure (Prensky, 2002; Wolf, 2012).

Taking into consideration the above trends, the present study is related to digital game-based learning, since the experiment is designed around an unstructured and informal educational setting with the use of commercial digital online games. The experiment is set in a home environment where playing is to be examined as a pastime and as such any device can be accessed to play the desired games. So, clarifying the use of the terms digital games and MMOGs in the present research is considered necessary. The former refers to games played offline in any device (Salen & Zimmerman, 2004), while the latter refers to games played online, interacting and collaborating with others as a member of a "designed" or selected team (Jung et al., 2014).

1.5 Conclusion

All in all, games are considered to have the strength to induce personal and transformative learning through performance (Chee, 2016). Regardless of the game type or form, similarities and benefits can be traced in all games making their value profound. So, in the next chapter the connection between games and foreign language learning will be explored.

2. Linguistic, Emotional and Cognitive Functions of Games in Foreign Language Learning

2.1 Introduction

In this chapter, theories related to foreign language learning in formal as well as non-formal educational settings will be reviewed with reference to teenagers who are the target group of this study. Additionally, emotional and cognitive functions affecting learning in general and vocabulary acquisition in particular will be discussed before the theoretical background of vocabulary acquisition in foreign language learning is explored.

2.2 Foreign Language Learning Theories in Games and Incidental Learning

In the field of language learning many theories and teaching practices have been developed aiming at successful native and foreign language learning and acquisition. The most influential of these theories throughout the years can be claimed to be behaviourism, cognitivism, and constructivism. Recently, however, there has been an increasing interest in incidental language learning as well.

Elements and features of all these theories can be found in all games. To begin with, rewards and points as a form of positive reinforcement signify behaviourism (Najmolhoda et al., 2015). It is through the different types of praise and rewards that learning is encouraged in case the desired behaviour is practiced successfully. Behaviouristic elements can also be identified during the gameplay when participants initially observe their peers, the steps and processes they take, so as to imitate and make patterns and models of what they consider as a potentially successful behaviour (Alduais, 2012). Observation is the key element of habit formation, responding to the creed stimuli, response and reinforcement which focus on the process rather than product (Baum, 2017).

As it was mentioned earlier, this study aims to investigate teenagers and more specifically the gap in research as far as out-of-school foreign language learning is concerned. According to Piaget's cognitive development theory (Goertzel et al., 2014) children from the age of 12 until they reach adulthood belong to the formal operational stage where they

are believed to be able to think creatively, in an abstract way, forming and testing hypothesis while using deductive reasoning and imagination without referring to physical objects. This means that not all games are appropriate for children of all ages. On the contrary, games should be designed, chosen and played according to players' age in order to respond to their intellectual and cognitive level. In this way, they can use their background knowledge to actively process information and expand their knowledge using symbolic systems (ideas and concepts) and creating representations through their interaction with the world (Suharno, 2010).

In cognitive development theory, interaction with the world, which is prominent in games, is divided into two different environments, the social and linguistic, which directly affect language learning and development according to Vygotsky (1962). In his theory, he maintained that the social environment's main feature is interaction, either verbal (through discussions) or non-verbal (through images, objects and sounds) and that the linguistic environment is the actual environment language is used for communicational reasons. As a result, these environments and the forms of interaction they initiate lead to new experiences and the development of higher order thinking where input (meaning), understanding (comprehensible input) and language use (communication) are of equal importance.

What should not be neglected is the absence of an "authority" and their instruction or guidance during the game in non-formal educational settings, which is substituted by exploration and discovery. Both exploration and discovery echo constructivism according to Piaget (1973), who argues that when knowledge is discovered in a learner centred teaching-learning process, it offers the benefit of deeper comprehension and reconstruction of background knowledge in order for the latter to be enhanced or improved while potentially false or outdated knowledge is being rediscovered. Additionally, all games expose players to authentic language and materials, something which is considered of great significance because of the engagement it offers to different learning situations (Wang & Burton, 2010).

The combination of features and elements of language learning theories in games might be one of the reasons why they have been so appealing and popularised in formal education. However, there seems to be a gap in foreign language learning research in cases of non-formal, out-of-school learning. Alduais (2012) highlighted the difference between

language learning and language acquisition as the former refers to learning through instruction, guidance and training while the latter to a subconscious, not directed learning. Playing games as a pastime can initiate what Laufer & Hulstijn (2001) define as incidental learning, according to which language is acquired unintentionally in a naturalistic way. In this sense, learning is not the primary goal and formal instruction or guidance is not offered (Hulstijn, 2013). This, however, does not mean that players do not realise the potential learning benefits (Ellis, 2009).

In the field of foreign language learning, incidental learning occurs through the exposure to different media (music, TV with subtitles, gaming, social media etc), which create an undefined learning content that provides learning opportunities (De Wilde et al., 2020). This is confirmed by researches investigating the relationship between daily exposure to different media and English as a foreign language (EFL) on children before they receive any formal instruction. They all agreed that substantial exposure to English through the abundant input in the target language assisted them to improve and develop their skills (reading, listening, writing and speaking) and overall proficiency (De Wilde et al., 2020; Jensen, 2017; Lefever, 2010). Research focusing on digital games and MMOGs also suggests that EFL is incidentally supported and encouraged because of these games' linguistic (frequency of exposure, repetition communicational tools etc) and sociocultural parameters (social interaction, collaboration competition etc) (Blume, 2020; Cornillie et al., 2012; Pasfield-Neofitou, 2014; Reinders, 2017; Ryu, 2013). Learners are able to better memorise and produce structures effectively when they are frequently exposed to either the same or similar examples of the target knowledge with comprehension, though, being stronger than production as the latter is more cognitively demanding (Denhovska et. al, 2016).

Having discussed the link between language learning theories as well as teaching practices and games, in the next section an effort will be made to identify the cognitive and emotional elements that can be traced during gameplay and their association with learning.

2.3 Emotional and Cognitive Functions and their Relationship to Games

What was attempted in the previous section was to highlight the association between games and learning theories. In this section, the relationship between emotion, cognition

and games is explored so as to identify and better understand learners' individual characteristics that can lead to successful learning.

For many decades cognition and emotion have been treated as two different and totally disengaged aspects affecting learning (Schutz & DeCuir, 2002). Researchers' interest on emotional functions was diminished, whereas cognitive functions were prioritized (Swain, 2013). Nowadays, however, it is assumed that cognitive and emotional functions are inseparable and integrated and that separating one from the other might be a slip as they both constitute brain functions that work in parallel (Pessoa, 2008). Taking that into consideration, it could be maintained that emotions directly affect and trigger cognitive functions; a process that has an impact on learning and achievement. More specifically, an individual's positive or negative emotions towards a task can either increase or decrease their motivation, reinforce collaboration as well as interactivity and affect their memory (Pekrun, 1992).

Research has shown that educational games reinforce and promote engagement and transfer of academic content to academic tasks (see section 1.4) (Papanastasiou et al., 2017; Pierce & Cleary, 2014; 2016). This proves that games' cognitive and emotional benefits have been studied and used in formal educational settings (see sections 2.2 and 3.2); what would be interesting is to study the effects of gameplay for learning beyond schools (Blumberg et al., 2019).

As Granic et al. (2014) suggest cognitive and emotional functions are triggered by entertaining games and MMOGs because they expose players to simultaneous social, cognitive and emotional experiences. They also add that games give players the opportunity to learn through trial and error, promoting the latter's creativity and problem-solving skills in an emotionally "safe", autonomous and stable environment. In that way, learning is assisted (see section 2.2), fostering the development of social skills; something proved by children and teenagers' eagerness to play games (Bosworth et al., 2000). Games and MMOGs also have the potential to enhance cognitive abilities like selective attention and lead to content and skills' acquisition (Bediou et al. 2018; Franceschini et al. 2017). As far as the emotional experiences they offer are concerned, they are considered quite effective in teaching directly and indirectly strategies for self-esteem raise (Horan, 1996).

Hence, MMOGs generate positive emotions and improved mood to the players who experience comfort, encouragement, motivation and low levels of anxiety (Ryan et al., 2006). These positive emotions along with the social relationships built within the game environment subserve commitment, goal pursuit and coping with failure (Fredrickson, 2001).

2.3.1 Identifying the Different Types of Motivation

To start with, motivation is expressed through an individual's willing engagement, positive predisposition and reactions towards a task or learning content, which are not likely to change because of or during the process (Choi et al., 2012; Noe & Schmitt, 1986). Even failure is regarded as a means to increase motivation based on the incremental theory of intelligence (Dweck & Molden, 2005) (see section 1.4), since it highlights the need for persistence and effort (McGonigal, 2011).

Motivation, however, is classified as intrinsic and extrinsic. The former refers to a behaviour practiced and expressed for its own sake; because it is interesting, fulfilling and it offers pleasure (Cerasoli et al., 2014). Intrinsic motivation is better expressed through the self-determination theory (Deci & Ryan, 1985; Deci & Ryan, 2000) according to which persistence and intensity on the selected task will lead to better performance. Extrinsic motivation, on the other hand, is characterized by imposition and pressure, so the adopted behaviour is the result of its potential instrumental ends and outcomes (rewards, punishment or failure) (Noels et al., 2000). The use of extrinsic motivation patterns is frequently made in the hope that gradually it will be rendered into intrinsic motivation, ensuring and encouraging active engagement aiming at rewards (Deci & Koestner, 1999). According to Bavelier et al. (2011) all these changes in an individual's behaviour also constitute changes in their brain.

2.3.2 Collaboration and Interaction

A contributing to intrinsic motivation factor is collaboration, which is claimed to affect personality formation and development (Baskin et al., 2005). It is related to a group of people assessed as a unit based on their performance on a single, shared goal for which they assist one another regardless of their ability level (Johnson & Johnson, 1989; Smith, 2009).

One of the main features of collaboration is communication among team members that sets the ground for community construction, brainstorming, information sharing, knowledge transfer, intuitiveness and creativity all of which promote higher-level thinking and are aligned with constructivism (see section 2.2) (Britton, 1990; Biasutti, 2011). It is through extensive discussions that individuals explore, analyse and synthesize, using their critical thinking. In this way, they are exposed to input (target language), output (production of the target language) and implicit (problems arising during the interaction) or explicit (stating a problem's existence) feedback (Gass et. al, 2013). This process renders individuals into independent learners in a non-threatening environment, who experience different aspects of the real world, belonging to different social groups that share similar social practices, and who are responsible for their own active learning (Gee, 2007; Moore et al., 2020).

Competitiveness within a cooperative environment is another significant factor. It always underlies, creating negative goal interdependence (Johnson & Johnson, 2018) as every team "struggles" to achieve their goals before their competitors; intrinsically motivating both parties to succeed leading one of them to defeat and failure (Deutsch, 2011). In reality, teams and their members are engaged into a power struggle where the ultimate goal is to find ways to increase their own power at the expense of that of their "opponent's". Cooperation, however, can prove to be difficult or ineffective in case team members fail to get along and communicate fruitfully or in cases of unequal contribution to the task (Tseng & Yeh, 2013).

2.3.3 The Different Types of Memory and its Connection to Emotions

As far as memory as a cognitive function is concerned, there has been a tremendous interest in the field of psychology, education and medicine research. In the field of education, memory consists a contributing to learning factor as learners need to remember the acquired knowledge in order to develop and improve their learning.

Memory could be claimed to help people retain new information and past experiences so as to draw and use them upon request (Poo et al., 2016). Cognition and memory are influenced and can be modified by emotions and vice versa (Tyng et al., 2017). This indicates that memory functions and responds more effectively and potentially for longer

periods of time to emotionally driven content (Khairudin et al., 2011), something that can have profound implications for learning in non-formal educational settings. For instance, Vogel & Schwabe (2016) found out in their study that stress and time pressure at the moment of a task can enhance and boost memory promoting learning. According to Brébion et al. (2007) there are three stages related to memory. The first one is encoding, during which the received information is transformed into something meaningful like a mental representation that can be remembered. What follows is storage where the transformed information is retained and the last stage is retrieval during which the previously stored information is extracted and used accordingly.

Research has shown that there are two types of memory that follow all three aforementioned stages. The first type is that of short-term memory, which is responsible for the temporary storage and production (recall) of a small amount of information used untransformed and probably unstructured (Swanson et al., 2009). This information has to be as simple as a digit or a word and the memory capacity, which lasts for a few seconds unless the items are rehearsed, is limited to approximately seven items (Miller, 1956). The second memory type is long-term memory, which is responsible for information storage over extended periods of times if not indefinitely (Richardson-Klavehn & Bjork, 2003). Nobody can say for sure and no research can delineate its capacity or set a time frame regarding its duration (Sternberg & Sternberg, 2011). What can be suggested, though, is that rehearsal and repetition of new or recent information can assist and facilitate its transition from short to long-term memory (Jansari et al., 2010). Digital games and MMOGs share the elements of repetition and rehearsal and consequently have the potentials for foreign language learning in general and vocabulary acquisition in particular. This transition, however, is a multistage process and there is little knowledge on how this information is stored in long-term memory for more than 24 hours (Navarro et al., 2021).

2.4 Vocabulary Learning and Games

In this section we are trying to understand how linguistic knowledge in English as a foreign language can be achieved and enhanced naturally and whether games can be a contributory factor to that end. Nobody can read or communicate (verbally or in writing) in a foreign language without a great stock of words (Graves, 1986; Rubin & Thompson,

1994). So, it would not be naive to claim that vocabulary is the main feature of any language.

According to Sandiuc (2019), one of the approaches related to vocabulary acquisition is incidental vocabulary learning which occurs naturally after individuals are exposed to written or verbal materials (see section 2.2). Better effectiveness in vocabulary learning is observed when vocabulary instruction is provided by context (Subon, 2016). Learning from context is supported by some context clues (Sternberg & Powell, 1983; Sternberg et al., 1983; McKeown & Beck, 2014), which are related to the frequency and variability of the contexts new words appear in so as for their properties and functions to be better understood. They also suggest that background knowledge as well as experiences assist the identification of interconnections between words and their categorization to the correct word family in the already existed mental lexicon. Another significant clue is the new words' salience for the accomplishment of a task (Musa, 2015). In other words, whether the new vocabulary is necessary or not will define whether it will be ignored.

However, being exposed to new vocabulary and being able to understand its meaning signifies comprehension, which does not necessarily lead to acquisition (Gass et al., 2013). Thornbury (2002) identifies acquaintances which are recognizable and understood words without, though, being mastered the same way as the individual's native equivalents. What happens during this process is fast mapping (Carey, 1978) which refers to somebody's ability to have an overview of a word's meaning after being exposed to this word. Vocabulary acquisition is a permanent state and according to Swain (as cited in Gass et al., 2013) the key element for successful acquisition is the productive use of new knowledge in the form of output. This will facilitate the transition from semantic to syntactic processing.

Games are instructive in their nature and can affect positively especially EFL learners' vocabulary learning, knowledge and retention because they are motivational and inspirational (Rahimi Esfahani et al., 2019). The games' visuals, music, instructions and hints promote interaction which is stimulated by some sort of communication pressure during which individuals are exposed to input (target language), output (production of the target language) and feedback shared among players. When playing, vocabulary is

practiced and experimented in a safe environment where exposure and criticism have no place (Swanson & Howerton, 2007). In that way, personal interest is raised and it seems to promote eagerness and commitment supported by mental effort and productive use (Restrepo Ramos, 2015), rendering receptive vocabulary simultaneously into productive (Baker et al., 2016; Vásquez & Camacho Ovalle, 2019). This assumption is in accordance with Izumi (2002) who stated in his study that subjects who were required to engage in a deeper level of analysis through the production of output better stored newly acquired vocabulary in their long-term memory.

During this process players develop and use multiple techniques and strategies in an attempt to negotiate meaning (Turgut & Irgin, 2009). Some of these can be looking up unknown words in a dictionary, asking for clarifications, decoding or relying to cognates. De Groot & Keijzer (2000) define cognates as words that share phonological, semantic, spelling and etymological similarities between one's native language (L1) and a foreign language. They also consider this type of words easier to learn and master. Laufer & Hill (2000) claimed that the use of their subjects' both native and foreign language contributed to better retention as the two languages offered multiple information and triggered a deeper and more elaborate processing. What can reinforce memory and acquisition is extended mapping (Carey, 1978) which requires someone to take learning in their own hands in an effort to achieve a deep understanding, familiarization and frequent retrieval from memory of the intended vocabulary (Thornbury, 2002).

2.5 Conclusion

In this chapter, an attempt was made to present how foreign language learning can be encouraged and promoted through playful activities and to present the foundations of this research. Considering emotional and cognitive functions core elements to this process, there was an overview of motivation, collaboration, interaction and memory. Additionally, issues affecting games' contribution to second language (L2) vocabulary acquisition in a natural way were presented.

3. The Research Design

3.1 Introduction

The aim of this chapter is to present the research questions and discuss the adopted methodology. Then a discussion related to the theoretical background of the research designs used for the collection of data is attempted followed by a description of the characteristics of the research sample.

3.2 Research Questions

Even though the educational value of games in general and digital games as well as MMOGs in particular has been shown by the literature review (see section 1.4), there seems to be discordance on whether and to what extent commercial games of these kinds can actually contribute to EFL vocabulary acquisition. Reinhardt & Sykes (2012) admit that the relationship between these kinds of games and second or foreign language learning is underexplored. DeHaan et al. (2010) stated that they have a minimum contribution to vocabulary acquisition since their subjects were able to recall only a few new items they had come across due to cognitive overload. In their study, however, they focused on digital games played by a single individual. Ebrahimzadeh & Alavi (2017) studied the effectiveness of commercial digital games and MMOGs in vocabulary acquisition and highlighted their beneficial role as supplements to coursebooks within formal educational settings though. On the other hand, Chen et al. (2018) and Li et al. (2021) were able to identify the significant contribution of digital games and MMOGs on vocabulary acquisition in their study. Their analysis, however, focused on digital game based learning (see section 1.4) in formal educational settings only. A similar approach was adopted by Koufopoulou (2015) who claimed that teachers opt for digital games in order to enhance their students' vocabulary unless they intend to teach idiomatic language. She stressed, though, that the right selection of game is of importance and that the paper-based game she designed for the purposes of her experiment was more efficient than its digital version. Calvert (2015) highlighted in her research that there are only few studies examining the relationship between digital games and cognitive skills' development during adolescence. Thus, since the majority of studies are interested in exploring digital

games and MMOGs within a school environment and in how teachers can use them to promote EFL in general and vocabulary development in particular, it would be worth researching the use of commercial MMOGs in informal educational settings and whether incidental learning (see section 2.2) in relation to vocabulary acquisition is likely to occur. Therefore, this research aims at providing answers to the following research questions:

1. To what extent do commercial MMOGs contribute to vocabulary acquisition in an informal educational setting?
2. What techniques are used in order for the meaning of new words to be derived in an informal educational setting?
3. Is newly acquired vocabulary retained in the individual's long or short-term memory?

In order for the above research questions to be answered a qualitative method was selected and applied. What authorized the present case study, which seeks to explore whether vocabulary acquisition and retention with the use of MMOGs in an informal educational setting can be achieved or not, was a signed by both parents ethics consent (see Appendix 1, p. 66). Prior to the presentation and discussion of the results an in-depth analysis of the method analysis, the research method and data collection tools will be made

3.3 The Rational Behind the Qualitative Research

The present study was designed and conducted following the principles of a qualitative research in an attempt to explore and examine the aforementioned research questions. Nevertheless, trying to use a single definition to describe what a qualitative research is would be quite difficult as it consists of a wide variety of theoretical and methodological approaches, all of which attempt to study a wide range of problems (Denny & Weckesser, 2019). That is the reason why it was considered better to highlight those principles and features that made the selection of a qualitative research the most appropriate method for the needs of this study.

According to Sinkovics & Alfoldi (2012) this type of research is interpretative in nature and seeks to explore and to understand in-depth why and how different behaviours and thoughts are adopted by individuals, rendering the whole process into an empirical naturalistic study that focuses on real-life, social events. They claim that this is succeeded by giving "voice" to participants. This "voice" is then evaluated by the researcher, who is

the only one “responsible” for the interpretation of the collected data. This is a time-consuming process that needs a long-time investigation and leads to lengthy reports. As a result, conducting a qualitative research is not an easy choice to make, since recording and collecting real-life data is not always a smooth process. There is always an underlying “risk” for accidents, on-the-spot decisions or serendipities that can either facilitate or impede the course of the research, making the need for decision making, re-evaluation and renegotiation constant (Van Maanen, 1998). This allows the exploration of perspectives that might be otherwise overlooked, offering an improved understanding of the studied phenomenon (Carter et al., 2014; Aspers & Corte, 2019).

According to Kuper et al. (2008), as far as data collection is concerned, it can be obtained from interviews (structured, semi-structured and unstructured), focus groups, observations diaries or other written artefacts. It is then analysed inductively and meaning emerges (Britten, 2005). There are, however, no firm or standardized guidelines or methods that direct researchers on how to analyse the collected data, something that explains and justifies the interpretative nature of a qualitative research (Creswell, 2007). Additionally, findings of a qualitative research are not to be generalised, but transferable to other contexts (Kuper et al., 2008). That is to say, readers have to assess whether the assumptions made within a research can be applied to their contexts as well or not.

As it was mentioned earlier, a qualitative research is an empirical, naturalistic study. That is why it requires triangulation, using at least two different types of methods to compare and contrast a researcher’s insights into the phenomenon explored on the one hand and the collected information on the other (Reeves et al., 2008). In that way, the validity of the collected information and assumptions made is ensured. After all, contrasting people’s sayings regarding their actions with their actual behaviour is often important as they might differ. In the present study, triangulation was applied following what Polit & Beck (2012) call method triangulation and two different methods (see section 3.5.1 and section 3.5.2) were selected to test veracity of the obtained information.

3.4 The Research Method

The selected qualitative research method for the needs of this study to be met was a case study, which according to Gerring (2011) offers the benefit of an in-depth examination of

a particular case, which will provide reference on EFL vocabulary acquisition and retention with the use of MMOGs and will allow a “hypothesis” to be designed, leading to further analysis. He also maintains that during a case study qualitative in most cases (Creswell, 2013) original and naturalistic (real life) data are collected over a period of time with the purpose of examining contemporary and sophisticated phenomena empirically in an effort to understand and “generalize” the conclusions drawn. These phenomena or real-life events are scrutinized using multiple method designs to extract and carefully evaluate evidence, triangulating in that way data that seek to answer to “why”, “what” and “how” questions giving the study an explanatory nature (Yin, 2014). For the needs of the present research and in order to triangulate data, two different data collection tools are used. The first one is a semi-structured interview (see section 3.5.1) and the second one is observation (see section 3.5.2).

Additionally, the data of such a study are extracted and examined within a specific context, which can consist of a finite number of subjects like an individual (single case study), a small group of individuals or a small geographical area (multiple case study) (Ebneyamini & Sadeghi Moghadan, 2018). This could imply that a researcher’s decision to conduct a case study heavily depends on whether they have control over the context’s behavioral events or not. For the purposes of the present study, a single case consisting of one teenage, male participant (see section 3.6) was considered the most effective research method in order for the researcher to explore vocabulary acquisition and retention with the use of MMOGs. As far as the researcher’s role is concerned what was attempted was to adopt what Pohl et al. (2010; 2017) define as a reflective scientist’s role and perform activities close to what is understood as “research”. More specifically, they claim that a reflective scientist tries to systematically collect, analyse, interpret and report data from an observer viewpoint, striving for objective or intersubjectively recognisable results. Despite some hesitations on the validity of case studies, in some cases experimental and survey researches might not be able to fully explain and elaborate on these types of questions (Zainal, 2007).

3.5 Tools Used for Data Collection

The following sections aim at presenting and analyzing the tools that have been used so as to collect qualitative data for this research as well as the method used for their analysis.

3.5.1 The Semi-Structured Interview

Interviews could be claimed to be one of the most appropriate and preferable tools in qualitative research (Sandelowski, 2002). An one by one interview was employed due to the main advantage offered which is that the researcher can trigger and observe the interviewee's both verbal and non-verbal (body language and facial expressions) cues during their face to face communication through questions of gradual "difficulty" in order on the one hand to familiarize the latter with the research's subject and on the other to explore and better understand their reflections and perspectives of a phenomenon (McGrath et al., 2019). In that way, potential hidden or unconscious meanings could be explored (Gillham, 2005; Ryan, Coughlan & Cronin, 2009).

What was selected for the present study was a semi-structured interview that preceded the second tool used for data collection. The ideology behind the selection of a single interview was to allow the participant to share their experiences and viewpoints regarding vocabulary acquisition and retention with the use of MMOGs during their free time. The researcher opted for the participants' own voice to be heard, before any other form of data form another "inside" or "outside" source "intervened", giving them the time and space necessary for them to express their own personal feelings, experiences and opinion on the matter. It was considered that in that way feelings of anxiety could be prevented and avoided so as for their answers to be unbiased. Furthermore, a preceding interview was thought of as a source that would offer data which then, using the second data collection tool, would be verified, rejected or expanded in case of neglected by the participant aspects.

The whole interview was recorded after receiving a written consent from the participant's parents (see Appendix 1, p. 66), as it is considered one of the most effective data collection ways (Mondada, 2007). During the semi-structured interview questions were predetermined and organized around three thematic areas (Lune & Berg, 2017). The first category focused on demographics and intended to explore and discover the interviewee's profile. The second category focused on questions related to vocabulary acquisition and how this can be achieved while playing MMOGs. The third category focused on vocabulary retention and retrieval when necessary. This type of interview allowed for the

“extraction” of the interviewee’s opinions and perspectives through their subjective responses to open ended questions regarding an experience of theirs, which is related to the subject of the research (McIntosh & Morse, 2015). The objective behind these questions was to explore, discover or even understand a phenomenon as it was experienced by the interviewee; with the researcher maintaining, however, responses’ control directing the interviewee’s answers to the aforementioned thematic areas of inquiry in order to avoid ambiguity. This is the reason why, the latter was sometimes regarded as a source of knowledge, especially in cases of underexplored topics or in cases of knowledge being acknowledged to be limited (Richards & Morse, 2013). Open ended questions are admitted to offer interviewees freedom to answer as they wish providing the researcher with clarity and flexibility even in cases of unanticipated answers, which can be achieved through probing (follow-up questions or request for further elaboration) (Balusi, 2018).

3.5.2 The Observation

A second qualitative data collection tool that of observation was also employed in order to triangulate the data and ensure the validity and reliability of the present study. According to FitzGerald & Mills (2022) observations can provide a researcher with real-time data on the studied behaviour in a natural setting. He claims that this offers the benefit of identifying and interpreting not only the information the participant wants to share, but also information they might neglect, be reluctant or unable to share.

For this reason, the selected method for recording data was a relatively unstructured observation for which the researcher designed a set of predetermined open-ended questions (see Appendix 3, p. 73) in order for particular actions and behaviours to be recorded in the form of handwritten notes (Walshe et al., 2012). In this way, the researcher was able to predetermine the behaviours and actions of interest during the data collection process and to fully describe what they saw and heard during the observations. More specifically, the researcher wanted to observe the participant while playing MMOGs as a pastime in order to “discover” his handling of new vocabulary. They tried to identify what methods were used by the game and what strategies the participant employed to derive the meaning of unknown words. Additionally, the researcher’s intention was to identify the techniques offered by both the game and used by the participant that would facilitate

vocabulary retention and to understand whether it is stored in his short or long-term memory. The underlying attempt was to examine the potential contribution of MMOGs played in a non-formal educational setting to vocabulary acquisition. There are, however, different approaches as far as note taking is concerned. Researchers can choose between keeping notes during the observation, shortly after or later on during the day (Mulhall, 2003). What was decided for this study was to record some notes reflecting on the designed questions during the observation and right after the observation ended to write down comprehensive notes and thoughts, in an attempt to go as deep as possible and not to forget information and details important for the study.

After the selection of the observation's approach, the researcher had to decide on the sampling strategy employed and their role during the observations. In this case, an event-sampling (Mulhall, 1998) was considered as more appropriate for behaviours to be observed. As a result, the researcher and the participant agreed to meet at the participant's home at a time convenient to both, because this is the place where the latter usually plays MMOGs and feels more comfortable. The role adopted was that of a non-participant observer, according to which a researcher only observes their participants without interfering in the process in any way (Bloomer et al., 2012). What was actually attempted was for the researcher to be seen as an independent outsider who keeps their opinions to themselves. Consequently, they only witnessed and experienced what their participant actually did, using their own senses.

3.6 The Participant's Profile

The subject of the research is a twelve-year-old monolingual male whose L1 is Greek. He attends the first class of Junior High School in the southern suburbs of Athens and he began learning English at the age of six at a local private English language school. For the past three years, he has been attending English private lessons at home. He is an Independent User of English according to the Common European Framework (CEFR) for languages (Council of Europe, 2001), which identifies six reference levels namely Basic Users (A1 and A2), Independent Users (B1 and B2) and Proficient Users (C1 and C2), and he is sitting for the B2 level exams in May 2022. His vocabulary level and knowledge of grammar are satisfactory. Oracy is his strength because of his sociable and extrovert personality. Thus, as a speaker he is quite fluent and accurate and as a listener he can fully

understand audios related to listening tasks as well as his interlocutors during discussions on every day issues and topics of his interest. However, he feels a bit uncomfortable and stressed when he is engaged in discussions on social issues he cannot generate ideas on and argumentation due to lack of experience or knowledge. Additionally, he acknowledges that sometimes he describes terms he does not know in the target language and that his expression in the target language is sometimes affected by his L1 especially when speaking. As a reader, he is able to effectively comprehend the central ideas of sophisticated texts as long as they are related to familiar to him topics.

3.7 Analysis of the Collected Data Using the Method of Interpretative Phenomenological Analysis

The employed method of data analysis for the purpose of the present study was the Interpretative Phenomenological Analysis (IPA), which according to Smith et al. (2009) has its roots in phenomenology and hermeneutic and seeks to understand how individuals experience their world taking into account their subjective opinions and perspectives. After all, the essence of a qualitative research is to put oneself in another person's shoes, to experience the world from their perspectives and stay true to them (Sutton & Austin, 2015).

According to Smith (2011), for that to be achieved an interpretation of the individual's experiences in relation to the context and of the research has to be attempted. This process is characterized by flexibility and should not be directed by a single method of working (interviews, focus groups, observations or diaries). He also claims that the key element for successful IPA is that the analysis of the participant's cognitive and affective reactions to what they experience needs to be in-depth, coherent and plausible. The aim of the interpretations made in this study was for them to be strong and illustrative of the participant's accounts. Therefore, the researcher had to understand not only what the individual was saying, but also what he was not saying; what was implied or "hidden" underneath his words (Smith, 2015). During an IPA, the researcher had the central role, since they were the ones responsible for the reflection and analysis of the collected data (Brocki & Wearden, 2006). This, though, did not minimize the significance of the

participant's role since the researcher's interpretations were based on the former's ability to eloquently express his thoughts and describe his experiences (Baillie et al., 2000).

Alexander & Clare (2004) state in their work that semi-structured interviews are the best method for data collection because of the collaborative environment they "create" between the researcher and the participant. In this environment emphasis was given during the semi-structured interview to the participant since he was offered the opportunity to tell his stories in his own words (Brocki & Wearden, 2006). Apart from interviews, observations can also be used as a data collection method in IPA. Larkin & Griffiths (2002) admitted that observations are selective and interpretative in their nature and as such it may be difficult for the same depth to be offered as far as interpretations are concerned compared to other qualitative methods. They, nonetheless, state that observational notes' analysis offers credible, well-grounded data depicting "an insider's" perspective. During the observations, the researcher witnessed the participant's real-life experience with MMOGs and new vocabulary in real time, so the notes they took could be claimed to representatively and realistically describe the situation they observed.

3.8 Conclusion

The aim of this chapter was to present the research questions of the specific study and the research methodology adopted in order to address them. It also examined the data collection tools used, that is the semi-structured interview and observation, and the participant's profile as well as the method of data analysis, which in this case was IPA.

4. The Research Results

4.1 Introduction

The purpose of this chapter is to present and discuss the results of the research made in an attempt to assess the extent to which MMOGs played in a non-formal educational setting can contribute in vocabulary enhancement and acquisition. Initially, the results from the semi-structured interview will be analyzed. Then, in order to triangulate the findings, the qualitative data collected during the observations will be described and evaluated.

4.2 Presentation and Discussion of the Semi-Structured Interview

Findings

The data collected from the semi-structured interview were transcribed into written text (see Appendix 2, p. 67), analyzed and listed into three thematic areas. An IPA approach (see section 3.7) was adopted in order to analyze the collected data, according to which a researcher intends to understand how a phenomenon works and why it has emerged in practical terms (Lune & Berg, 2017). According to Strauss & Corbin (1998) in order for the data to be examined after deciding on the thematic areas, a researcher needs to organize the semi-structured interview's questions based on an axial coding. This will allow for a conceptual framework for the data to be created since data are sorted into categories (Elliot & Timulak, 2005).

The first axis' purpose was to collect demographic information. For this reason, the interview began with some general questions (Laforest, 2009) aiming at familiarizing the participant with the process and making him feel more comfortable. As far as the participant is concerned, he is a teenage male who lives in a big city and attends the first year of Junior High School (see section 3.6). Concerning his level in English, he stated that he is an Independent User of the target language as he has been attending lessons for the past eight years. Apart from the lessons offered by the State School, he claimed to have attended English lessons at a Language School and currently he is attending private lessons at home.

The second axis focused on the participant's viewpoint on playing digital games and MMOGs (see sections 1.3.1 and 1.3.2). He claimed that it is one of the free time activities

he enjoys engaging in (Galvis Guerrerro, (2011), since playing helps him relax and escape from his daily routine and the demanding school responsibilities (see section 1.3.2). He added that he is of the opinion that MMOGs can contribute to vocabulary enhancement up to a point "...Up to a point yes". According to his responses, he prefers playing MMOGs with his friends. He stated that interacting with friends motivates him and makes the game more exciting and interesting due to the different skills' level each one of them has (see sections 2.3.1 and 2.3.2). As far as the time spent on playing, he mentioned that the time he devotes is between one and two hours per day, but on weekends only. As he stated, he does not play during weekdays "... between three and four hours for the whole weekend".

The third axis revolves around the language used in MMOGs and new vocabulary meaning derivation. What the participant claimed is that everything within the game environment is in English, which results in him often finding words he does not know. He also mentioned that understanding the meaning of these words will be of assistance in order to continue playing (see section 2.4). That is the reason why instead of ignoring them he affirmed that he chooses to try to understand their meaning. As far as the techniques he uses for meaning derivation to be achieved are concerned, he alleged that what helps him understand the meaning of new words is visuals, sounds and context that accompany these words "... Yes, visuals, sounds as well as context are of help". The participant also claimed that cognates (see section 2.4) are of assistance (Laufer & Hill, 2000) and that repetition affects his understanding of new vocabulary because of the experience he gains from playing multiple times the same MMOG. However, he admitted that he has never used other resources, like a dictionary, in order to understand or verify the meaning of an unknown word. On the contrary, the source he stated to seek help from is his co-players, who are either more skillful in English or more experienced in playing a game "... I ask about words I have never encountered before", "... they know better English than I do or they have played the game before so they have seen this word before".

The forth axis investigated whether meaning derivation, which occurs while playing MMOGs, can also lead the participant to retain and retrieve new vocabulary whenever necessary or not. According to his response, after encountering and understanding the same originally unknown word once or twice within the game environment, he is able to

recall it "... once or twice is enough". He also mentioned that he is able also to recall this word's meaning if he sees or hears it from another source, like a text, a video or a discussion, at a random moment "... I will remember the example I've seen in the games and I will be able to remember the word's meaning". This implies that both his short and his long-term memory are activated as a result to his "exposure" to MMOGs (see section 2.3.3). As far as the retrieval and production of new vocabulary are concerned, the participant stated that he mainly uses vocabulary he has learnt from MMOGs to write texts for his English lessons "...to do a writing task for my English lessons".

4.3 Observation's Presentation and Discussion

The set of predetermined questions (see Appendix 3, p. 73) the researcher used during the observations as well as the comprehensive notes (see Appendix 4, p.76) they kept after each observation provided valuable data to the present study. Initially, being in his own space provided the participant with feelings of comfort and responsibility "The participant was seated comfortably in his own bedroom wearing casual clothes", "While talking to himself he wondered whether it would be a good idea to play with people he didn't know, but he directly rejected this idea as his parents' only condition to allow him to play is never to talk to strangers in the virtual world". Comfort because he was in a safe environment where he could express himself any way he wanted without being intimidated by deadlines to be met or the disappointment a potential failure would bring and responsibility because he was the one responsible to set goals and make decisions on which game for example he would choose to play, for how long or whether he would respect house rules or not (see also section 2.3). He decided to play two different MMOGs either as a member of a team which consisted of friends of his or solo "They started playing solo a MMOG online on PlayStation because none of his friends was online at that time", "This time he had arranged with four friends of his to play online". He did not express any desire to interact with strangers mainly out of respect for the rules his parents have set.

The language used in both MMOGs was English. The games did not offer the option of using a different language. As a result, the participant frequently encountered words he saw for the first time or which had a different meaning from the one he already knew. The techniques he used to infer the meaning of those words were various. One of the observed

techniques was that he used his already existing knowledge in association to the stimuli he received (Shabaneh & Farrah, 2019) to check whether the meaning he had in mind could be applied to the specific context in an effort to process the received information and expand or reconstruct his knowledge (see sections 2.2 and 2.4) "...So, the participant used his background knowledge in order to derive meaning. He related the word "mentality to the word "mental", which he was aware of, and managed to understand the former's meaning.", "...His first reaction was to use his background knowledge. He knew that one of the meanings of the word "chest" was referred to a body part, but the context in which the term was used and the visual offered led him to reject his first thought." This technique proved to be quite effective, on the one hand, when the participant was able to associate the new word to one of the words stored in his mental lexicon. On the other hand, when the unknown word was used with a different or specially designed for the purposes of the game meaning this technique had to be rejected and replaced by another.

So, he frequently relied on visuals offered by the game to derive meaning "...the word "fishing rod". It was offered as a tool to his character by the game in order to catch and ride a shark. So, when he saw the word on the screen and the item presented, he was able to associate them". It seemed more immediate and easier for him to relate the meaning of a word to the image he saw on the screen or to observe his character's actions and their results in order to infer meaning (see section 2.2) "... he encountered the word "big shield", which was unknown to him, he directly related the word to the image presented and he was able to understand its meaning". What he did not consider, though, was that the visuals might not always provide him with the original meaning of the word, but with a different meaning especially "designed" for the purposes of the game or with an approximate meaning "... One of the unknown words the participant encountered was "klomberry" which was represented as some sort of berry by a visual. Even though such a term does not exist, the participant was satisfied by the meaning the visual offered and did not seek for more information on the term from another resource ...".

Another technique he used for meaning derivation was context. Reading instructions given by the game exposed the participant to full sentences, which assisted him to understand the meaning of the intended word (see also sections 2.2 and 2.4) "He knew that one of the meanings of the word "chest" was referred to a body part, but the context in which the

term was used and the visual offered led him to reject his first thought". However, when these sentences were short, deriving meaning proved to be a difficult task "The participant didn't understand the meaning of the word "spotlight" despite it being in context and there was no visual or sound that might have helped him to derive meaning.". Hence, he turned to his friends asking for help whenever he played in a team and could not understand a word "The participant's first reaction was to ask his friend whether he knew the meaning of the word...". Their help was more immediate and direct since the meaning was provided in their L1. The participant did not seem to hesitate to offer and ask for his friends' assistance whenever linguistic or other hindrances occurred because he regarded them as his equals. This non-threatening environment motivated him as well as all the other team members to share information and transfer knowledge to one another so as to continue their gameplay and achieve the goals they had set (see also sections 1.2 and 2.3.2) "The second reason was that they have played the specific game level before and experimented trying different actions, so they had managed to derive meaning that they were willing to share with their co-players". Co-players were considered by the participant a reliable source of assistance on the one hand due to their experience with the game and on the other due to their fluency in English "...He trusted the members of his team for two main reasons. The first reason was that they knew the meaning of the unknown words and provided the participant with the Greek equivalent directly "...You are supposed to have a proficiency certificate"".

The last technique observed was that of experimenting and repeating (DeHaan, 2005) (see sections 1.4 and 2.4). Actions and steps taken during the game were repeated whenever deriving meaning was thought of as confusing or sophisticated (see section 1.4) "So, he experimented three times with the same instruction before he was able to understand the meaning of the word". There was no judgment or feeling of failure whenever the participant did not manage to win the game or accomplish a task. What he did was to play again trying a different approach while applying a different meaning to the unknown words until he discovered what would work (see section 2.4). However, even in cases where all the members of the team could not suggest an appropriate for their L1 meaning, they tried to adapt the new word to their own language "adding" a new word to their L1 lexicon, having understood, though, first its meaning either from visuals or as a result of

experimentation "They also tried to adapt new vocabulary they acquired to their L1. An example they used was with the word "loot", which was used as "λουτάρω".

Apart from the techniques used for meaning derivation, it would be worth mentioning the ones that were not observed. First and foremost, the participant did not make use of any other resources like a dictionary or the Internet that would probably assist and facilitate him to infer meaning "The participant didn't use any kind of dictionary (digital or print) during the gameplay...", "During the observation the participant did not use any other resources, apart from the ones offered by the game to derive meaning. What I sensed was that looking unknown words up in a dictionary for example was thought as unnecessary and boring...". A potential explanation might be that engaging in such a "time-consuming task" would change the nature of the game, which is to be seen as a hobby, and deprive the pleasure and excitement of the gameplay (see section 1.2). Another technique which was neglected was that of cognates "He didn't even realize that the word "epic" is a cognate so as to make the connection of the word's meaning between the two languages". The participant did not seem to be able to identify the phonological, spelling and etymological similarities between his L1 and English (see section 2.4) either because he was too absorbed by the gameplay or because relying on the visuals offered was thought of as a sufficient source for meaning derivation.

As far as recalling and retrieving new vocabulary are concerned, the participant seemed to be capable of remembering new words during the gameplay. Repeated exposure to the same vocabulary allowed him to both infer and recall its meaning, something which was expressed verbally while talking to himself and to his co-players (see section 2.3.3) "He could not only recall their meaning, but also every time he talked to himself about the things his character had to obtain, he used the English terms while navigating in the game environment to find them", "As far as memory and retrieval are concerned, the participant was able to recall the meaning of words he encountered during the gameplay after seeing them once or twice, especially when these words were important for the gameplay. This was proved by the fact that the participant used the English terms to refer to these words while talking to his friend, whenever he thought that the items and actions they represented were required to proceed in the game".

Despite most of the talking been done in their L1, both the participant and his co-players tended to use English terms to refer to words that were earlier identified as unknown “More specifically they communicated in their L1 to comment on each other’s performance during the game and in English when they referred to game resources, actions and steps they wanted to take”. English terms did not seem to be chosen due to lack of knowledge of their Greek equivalent, but more likely as a natural result of understanding their meaning (see section 2.4) “These terms came to his mind naturally, as if it was easier for him to recall them in English than in Greek”. This implicated that his short-term memory was activated and new information was stored in it. What was highlighted during the observation was that new words were more efficiently stored in his short-term memory when they were accompanied by visuals or when the participant’s friends provided him with the meaning of an unknown word as these cases were encountered more often (see section 2.3.3) “Unknown words which were accompanied by a visual or whose meaning was offered by co-players in their L1 seemed to be easier to recall after a single encounter”. One encounter and understanding was enough for him to recall and retrieve them using the English terms whenever he encountered them during the gameplay.

Compared to visuals and friends’ assistance, deriving meaning through context seemed a bit more difficult to result in recalling and retrieval “However, when new vocabulary was introduced in a context, for example instructions and directions, the participant had to come across the same instruction twice before he was able to fully recall their meaning”. In this case, the participant had to encounter the same or similar context two to three times on average before he was able to verbalize new vocabulary when talking to himself or to his friends. The assumed explanation behind this “difficulty” was that deriving meaning through context is a more sophisticated process which requires the identification of the appropriate context clues, background knowledge activation and the ability to make the appropriate interconnections between new words and the correct word family in the participants’ mental lexicon (see section 2.4) “This happened because visuals were more frequently presented and they referred to something very specific, whereas the instructions were a bit more complicated to understand and they did not appear with the same frequency”.

What was also interesting was the fact that the participant was also capable of recalling and retrieving new vocabulary he had encountered during the initial observations as well. During some of the observations he decided to play the same MMOG and new vocabulary he had encountered during the earlier observations was not only recalled, but also verbalized before it even appeared on the screen "The majority of these words represented tools and materials important for his game character and as such important elements of the gameplay. He could not only recall their meaning, but also every time he talked to himself about the things his character had to obtain, he used the English terms while navigating in the game environment to find them". For example, when the participant thought that a specific tool would help him complete a task, he had his character look for it in the game environment repeating to himself or his friends the relevant term in English "...he started repeating loudly in English "...harvesting tool... harvesting tool. I know you are here somewhere"". This implies that he had managed to store these new words in his long-term memory. The repeated exposure to the new vocabulary and the deeper level of analysis he engaged in through their production as output might have led to their transition from short to long-term memory and their maintenance for longer periods of time (see section 2.3.3) "The fact that the same instructions and visuals were presented multiple times during the gameplay assisted the participant to retain new vocabulary. After some time he was able to perform the necessary actions without looking at the instructions or the words representing the items. He also used new vocabulary and some of the vocabulary he learnt during the previous observation to talk to himself, using the English terms while seeking for them in the game environment".

4.4 Conclusion

The aim of the fourth chapter was to present and discuss the qualitative data collected from the semi-structured interview and the observations. What follows is an attempt to overview the research questions, discuss the implications and the limitations involved in the research content and process.

5. Implications of the Study and Future Research

5.1 Introduction

After having completed the presentation and discussion of the research, a connection should be made between the present and future research. Thus, research questions are revisited and analyzed so as to substantiate the initial hypothesis. Moreover, an effort is made to identify the limitations involved in the research content and process and to make suggestions for further research in the field of vocabulary acquisition with the use of MMOGs.

5.2 Research Questions Overview

According to the findings discussed in the previous chapter, MMOGs appear to encourage vocabulary acquisition which is not only understood, as far as its meaning is concerned, but also recalled and retrieved whenever necessary. The results of the semi-structured interview and observations have offered fruitful answers to the three questions of the present study.

1. To what extent do commercial MMOGs contribute to vocabulary acquisition in an informal educational setting?

The first research question sought to investigate the efficacy of MMOGs for the enhancement of vocabulary. The findings of the semi-structured interview (see Appendix 2, p. 67) and observations (see Appendix 4, p. 76) showed that the new vocabulary was successfully acquired. Namely, the meaning of unknown words encountered while playing was inferred, recalled and retrieved (Pellicer – Sánchez, 2016). Cases during which words' meaning was inferred and understood would signify simple comprehension, which needs to be followed by a byproduct like output (oral or written) in order to verify successful acquisition (Gass et al. 2013). The results of the research suggested that output is indeed produced both written and spoken. Yet, since there is no instruction offered by an expert (teacher) while playing a risk is always entailed for misconceptions or even mistakes. The observations identified misconceptions of that kind, which led to erroneous acquisition as the relevant words did not exist in the English lexicon or were used with a new meaning especially "designed" for the purposes of the game.

2. What techniques are used in order for the meaning of new words to be derived in an informal educational setting?

The second question revolved around the techniques used to derive meaning while playing MMOGs. Based on the collected from the semi-structured interview (see Appendix 2, p. 67) and observations (see Appendix 4, p. 76) various techniques were used to infer meaning. Visual representations (static or dynamic) of the intended meanings were the most preferred technique used because of the immediacy they offered. A direct association was made between what was seen on the screen and the unknown word leading to the understanding of its meaning. The second in preference technique used was context. Words were not presented in isolation, but in sentences in the form of instructions or directions. Whenever the majority of the words used in a sentence were known to the participant, he was able to infer the meaning of the one or two unknown words he had. However, if the sentence provided included many unknown to him words he had to seek for an alternative way to derive the meaning of words he thought would be more valuable for his gameplay. This alternative might have been cognates, which he recognized as a potential during the interview. Yet, during the observations he was not able to notice that one of the words he did know was a cognate. Apart from the visuals and context, the participant also relied to his friends' assistance as far as meaning is concerned. He did not hesitate to admit to them that he did not understand the meaning of a word and they often provided him with the answer he needed to proceed to the game. This hesitation was the result of familiarity he had with them as all of them were treated as equals "fighting" for a common purpose and no one was regarded as an authority. He did not have a problem to rely on their experience with the game or on their "better" skills in English. There were cases during which his co-players also asked for help when they did not understand the meaning of a word and if nobody knew, they agreed together on the approach they should take in order to infer meaning. This non-threatening environment encouraged them to continue this enjoyable task of theirs and not give up as no intimidation was felt and no judgment occurred during the gameplay. Additionally, in such an environment both the participant and his co-players were not afraid of failure. That is the reason why they did not hesitate to experiment with different actions and steps whenever an unknown to everybody word was encountered. They were more than ready to engage in a trial and error approach to find the one corresponding to the meaning of the word. One of the techniques identified through the observations, when trying to derive, meaning was the use

of the participant's background knowledge. Whether effective or not the participant did not hesitate to apply meanings he knew to infer the meaning of phrases; something that he did not mention during the semi-structured interview.

3. Is newly acquired vocabulary retained in the individual's long or short-term memory?

The third research question examined whether the vocabulary acquired while playing MMOGs is stored in the participant's short or long-term memory. According to the semi-structured interview (see Appendix 2, p. 67) and the observations (see Appendix 4, p. 76), the participant was able to activate and store new vocabulary both to his short and long-term memory. New vocabulary's meaning inferred with the help of visuals or peers seemed to be more easily recalled even after a single encounter. The participant did not face any difficulties remembering the meaning of unknown words, as he encountered them more than once during his gameplay. What was admitted during the interview and was also verified during the observations was that the first encounter and understanding led to short-term memory storage of new vocabulary. However, due to the repetitive nature of MMOGs the participant had to recall the meaning of the same word multiple times, which as result was stored in his long term memory. This was confirmed by the interview as well as observations during which the participant was able to recall the meaning of these words not only on the day of a specific observation, but also during the following observations. As far as the words whose meaning was inferred through context or experimentation are concerned, things were a bit different. Despite not acknowledging it during the interview, the participant had to come across the same word two or three times on average before they were capable of recalling their meaning. This difficulty in recalling was connected to the fewer occurrences of these words during the gameplay and to the more sophisticated mental processes necessary for meaning derivation. The same or similar instruction was given to the participant with a time gap longer than the one in the case of visuals. However, the participant managed to store this new vocabulary to his short-term memory and the more he played the more effective this recalling became, since after some playtime he was able to remember the meaning of the instructions including the previously unknown words. Once again, the repetitive nature of the game assisted new vocabulary storage in the participant's long-term memory. Whenever he decided to play the same

game he faced no difficulty recalling the meaning of the words he could not so easily remember before.

5.3 Implications of the Present Study

Undoubtedly, the study's implications need to be presented as they might contribute and encourage the integration of MMOGs, which are played in out-of-school settings, to foreign language learning process.

After taking a closer look to this type of games it could be said that the environment they engage teenagers in closely resembles the environment of an actual classroom (see section 5.2), which can be accessed at any given time setting in that way the foundations for a new model of teaching and learning (Childress & Braswell, 2006). MMOGs encourage interaction and cooperation among peers who share similar interests and who assist one another whenever hindrances occur (see sections 4.2 and 4.3). So, this type of games could be used as an additional tool encouraging students to use them in an unconscious naturalistic way in their free time both to revise and to improve their vocabulary. Concerns regarding the absence of an instructor that could offer valuable guidance can be eased. Teenagers and their co-players can solve this "problem". The former with the use of various techniques to derive meaning and the latter adopting the role of an instructor who patiently advises and directs the ones facing difficulties through every step while explaining without expecting, though, anything in return (see section 4.3) (Van Ommen, 2018).

Furthermore, given the repetitive nature of MMOGs both short and long-term memory can be enhanced and improved leading to better performance and as a result acquisition (see section 4.3) (Looi et al., 2016). For this to be achieved a number of different stimuli is offered both by the game and by co-players. This combination seems to motivate teenagers emotionally to actively and enthusiastically participate in the learning process even when they do not realize the educational nature of the game they engage in.

5.4 Limitations and Proposals for Further Research

In the hindsight, the fact that some limitations and room for improvement do exist in the present study cannot be disregarded. First and foremost the present study focuses on one

student only, thus findings are not to be generalized (Anisimora & Thomson, 2012). Moreover, the duration of the study was a month, something that does not offer an adequate span. That is why a longitudinal research is suggested as it could offer more informative findings on vocabulary acquisition and retention with the use of MMOGs. Another proposal is for research to be carried out on teenagers with learning difficulties. A research on that field could offer valuable information on whether MMOGs can facilitate their learning and “memorizing” of new vocabulary. A final recommendation would be to conduct a research that will examine how teachers can use MMOGs played in a non-formal educational setting as a supplement to their teaching in order to develop their students’ vocabulary and help them retain it.

5.5 Conclusion

In this chapter an effort was made for the research questions to be re-examined and elucidated. Additionally, it aimed at examining the implications of the present study as well as its limitations and to make some recommendations for future studies that could shed more light on the contribution of MMOGs played in non-formal environments to vocabulary development and retention.

Concluding Remarks

All in all, the focus of the present research was on a single teenager whose level in English was B2 and who participated in both a semi-structured interview and observation. For the aims of the research to be achieved two methods were selected and combined so as to triangulate data. Apart from the comprehensive notes taken right after each observation, some predetermined open ended questions (see Appendix 3, p. 73) were also designed in order for specific behaviors and actions of interest to be identified and kept in mind while keeping notes on what was seen and heard during the observations. What was proved by the collected qualitative data was that the participant developed his vocabulary playing MMOGs and that he was not only able to recall the meaning of previously unknown words whenever he encountered them, but also to produce them while talking either to his co-players or to himself. Additionally, he felt more motivated and encouraged to seek for and understand the meaning of new words in a natural way without expressing any begrudge about facing difficulties with new words.

Despite the limitations which are mentioned in Chapter 5 of the present study, the use of MMOGs enhanced the participant's lexicon in English. He enjoyed playing this type of games and at the same time learning new things (vocabulary) without being instructed to do so. The whole process was the result of willing engagement into the task of playing. That is why he regarded the independence and responsibility which were offered to him as highly motivating, especially when realizing that knowledge can be gained by simple everyday actions even if at a first glance they seem not to be of any educational value. Therefore, playing MMOGs could constitute an effective vocabulary source accessed in an entertaining manner.

References

- Aksakal, N. (2015). Theoretical view to the approach of the edutainment. *Procedia, Social and Behavioral Sciences*, 186, 1232-1239. doi: [10.1016/j.sbspro.2015.04.081](https://doi.org/10.1016/j.sbspro.2015.04.081)
- Alduais, A. M. (2012). Integration of language learning theories and aids used for language teaching and learning: A psycholinguistic perspective. *Journal of Studies in Education*, 2(4), 108-121. doi: [10.5296/jse.v2i4.2438](https://doi.org/10.5296/jse.v2i4.2438)
- Alexander, N., & Clare, L. (2004). You still feel different: The experience and meaning of women's self-injury in the context of a lesbian or bisexual identity. *Journal of Community and Applied Social Psychology*, 14(2), 70-84. doi: [10.1002/casp.764](https://doi.org/10.1002/casp.764)
- Anisimova, T., & Thomson, B. (2012). Enhancing multi-method research methodologies for more informed decision-making. *Journal of Administration & Governance*, 7(1), 96. Retrieved from <https://apprendre.auf.org/wp-content/opera/13-BF-References-et-biblio-RPT-2014/Enhancing%20multi-method%20research%20methodologies%20%20for%20more%20informed%20decision-making.pdf>
- Ashforth, B. E., & Mael, F. A. (1989). Social identity theory and organization. *The Academy of Management Review*, 14(1), 20-39. doi: [10.5465/AMR.1989.4278999](https://doi.org/10.5465/AMR.1989.4278999)
- Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research. *Qualitative Sociology*, 42(2), 136-160. doi: [10.1007/s11133-019-9413-7](https://doi.org/10.1007/s11133-019-9413-7)
- Badrinarayanan, V., Sierra, J. J., & Martin, K. M. (2015). A dual identification framework of online multiplayer video games: The case of massively multiplayer online role playing games (MMORPGs). *Journal of Business Research* 68(5), 1045-1052. doi: [10.1016/j.jbusres.2014.10.006](https://doi.org/10.1016/j.jbusres.2014.10.006)
- Baillie, C., Smith, J. A., Hewison, L., & Mason, G. (2000). Ultrasound screening for chromosomal abnormality: Women's reaction to false positive results. *British Journal of Health Psychology*, 5(4), 377-394. doi: [10.1348/135910700168991](https://doi.org/10.1348/135910700168991)

- Baker, D., L., Burns, D., Kame'enui, E. J., Smolkowski, K., & Baker, S. K. (2016). Does supplemental instruction support the transition from Spanish to English reading instruction for first-grade English learners at risk of reading difficulties? *Learning Disability Quarterly*, 39(4), 226-239. doi: [10.1177/0731948715616757](https://doi.org/10.1177/0731948715616757)
- Balducci, F., & Grana, C. (2017). Affective classification of gaming activities coming from RPG gaming sessions. In F. Tian, C. Gatzidis, A. Rhalibi, W. Tang, F. Charles (Eds.), *E-learning and games* (pp. 93-103). Dordrecht, Netherlands: Springer.
- Balusi, K. A. (2018). The use of online semi-structures interviews in interpretative research. *International Journal of Science and Research*, 7(4), 726-732. doi: 10.21275/ART20181393
- Baskin, C., Barker, M., & Woods, P. (2005). When group work leaves the classroom does group skills development also go out of the window? *British Journal of Educational Technology*, 36(1), 19-31. doi: [10.1111/j.1467-8535.2005.00435.x](https://doi.org/10.1111/j.1467-8535.2005.00435.x)
- Baum, W. M. (2017). *Understanding Behaviorism: Behavior, culture and evolution* (3rd ed.). New Jersey, NJ: Wiley-Blackwell.
- Bavelier, D., Green, C. S., Han, D. H., Renshaw, P. F., Merzenich, M. M., & Gentile, D. A. (2011). Brains on video games. *Nature Reviews. Neuroscience*, 12(12), 763-768. doi: [10.1038/nrn3135](https://doi.org/10.1038/nrn3135)
- Bediou, B., Adams, D. M., Mayer, R. E., Tipton, E., Green, C. S., & Bavelier, D. (2018). Meta-analysis of action video game impact on perceptual, attentional, and cognitive skills. *Psychological Bulletin*, 144(1), 77-110. doi: [10.1037/bul0000130](https://doi.org/10.1037/bul0000130)
- Bekoff, M., & Byers, J. A. (1998). *Animal play: Evolutionary Comparative and Ecological Perspectives*. Cambridge, UK: Cambridge University Press.
- Biasutti, M. (2011). The student experience of a collaborative e-learning university module. *Computer and Education*, 57(3), 1865-1875. doi: [10.1016/j.compedu.2011.04.006](https://doi.org/10.1016/j.compedu.2011.04.006)

- Bloomer, M. J., Cross, W., Endacott, R., O'Connor, M., & Moss, C. (2012). Qualitative observation in a clinical setting: Challenges at the end of life. *Nursing & Health Sciences*, 14(1), 25-31. doi: [10.1111/j.1442-2018.2011.00653.x](https://doi.org/10.1111/j.1442-2018.2011.00653.x)
- Blumberg, F. C., Deater-Deckard, K., Calvert, S. L., Flynn, R. M., Green, C. S., Arnold, D., & Brooks, P. J. (2019). Digital games as a context for children's cognitive development: Research recommendations and policy considerations. *Social Policy Report*, 32(1), 1-33. doi: [10.1002/sop2.3](https://doi.org/10.1002/sop2.3)
- Blume, C. (2020). Games people (don't) play: An analysis of pre service EFL teachers' behaviors and beliefs regarding digital game-based language learning. *Computer Assisted Language Learning*, 33(1-2), 109-132. doi: [10.1080/09588221.2B018.1552599](https://doi.org/10.1080/09588221.2B018.1552599)
- Bopp, M. (2006). Didactic analysis of digital games and game-based learning. *Affective and Emotional Aspects of Human-Computer Interaction*, 1, 8-37. Retrieved from https://www.researchgate.net/publication/288008641_Didactic_analysis_of_digital_games_and_game-based_learning
- Bosworth, K., Espelage, D., DuBay, T., Daytner, G., & Karageorge, K. (2000). Preliminary evaluation of a multimedia violence prevention program for adolescents. *American Journal of Health Behavior*, 24(4), 268-280. doi: [10.5993/AJHB.24.4.3](https://doi.org/10.5993/AJHB.24.4.3)
- Brébion, G., David, A. S., Bressan, R. A., & Pilowsky, L. S. (2007). Role of processing speed and depressed mood on encoding, storage, and retrieval memory functions in patients diagnosed with schizophrenia. *Journal of the International Neuropsychological Society*, 13(1), 99-107. doi: [10.1017/S1355617707070014](https://doi.org/10.1017/S1355617707070014)
- Britten, N. (2005). Making sense of qualitative research: A new series. *Medical Education*, 39(1), 5-6. doi: [10.1111/j.1365-2929.2004.02024.x](https://doi.org/10.1111/j.1365-2929.2004.02024.x)
- Britton, J. (1990). Research currents: Second thoughts on learning. In M. Brubacher, R. Payne, & K. Richett (Ed.), *Perspectives on small group learning: Theory and Practice* (pp.3-11), Oakville, ON: Rubicon Publishing

- Brocki, J. M., & Wearden, A. J. (2006). A critical evaluation of the use of interpretative phenomenological analysis (IPA) in health psychology. *Psychology & Health, 21*(1), 87-108. doi: [10.1080/14768320500230185](https://doi.org/10.1080/14768320500230185)
- Brown, S., & Vaughan, C. (2009). *Play: How it shapes the brain, open the imagination and invigorates the soul*. New York, USA: Penguin.
- Calvert, S. L. (2015). Children and digital media. In M. H. Bornstein, T. Leventhal, & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Ecological settings and processes* (Vol. 4, pp. 375–415). Hoboken, NJ: John Wiley & Sons, Inc.
- Camacho Vásquez, G. & Ovalle, J. C. (2019). The influence of video games on vocabulary acquisition in a group of students from the BA in English teaching. *Gist Education and Learning Research Journal, 19*, 172-192. doi: [10.26817/16925777.707](https://doi.org/10.26817/16925777.707)
- Carey, S. (1978). Child as a word learner. In M. Halle, J. Bresnan, & G. Miller (Eds.), *Linguistic theory and psychological reality* (pp. 264-293). Cambridge, MA: MIT Press.
- Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum, 41*(5), 545-547. doi: [10.1188/14.ONF.545-547](https://doi.org/10.1188/14.ONF.545-547)
- Cerasoli, C., Nicklin, J., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin, 140*(4), 980-1008. doi: [10.1037/a0035661](https://doi.org/10.1037/a0035661)
- Chee, Y. S. (2016). *Games- to- teach or games –to -learn: Unlocking the power of digital game based learning through performance*. Dordrecht, Netherlands: Springer
- Chen, M., Tseng, W., & Hsiao, T. (2018). The effectiveness of digital game-based vocabulary learning: A framework-based view of meta-analysis. *British Journal of Educational Technology, 49*(1), 69-77. doi: [10.1111/bjet.12526](https://doi.org/10.1111/bjet.12526)

- Chew, M. M. (2015). A critical cultural history of online games in China, 1995-2015. *Games and Culture*, 14(3), 195-215. doi: [10.1177/1555412016661457](https://doi.org/10.1177/1555412016661457)
- Childress, M. D., & Braswell, R. (2006). Using massively multiplayer online role-playing games for online learning. *Distance Education*, 27(2), 187-196. doi: [10.1080/01587910600789522](https://doi.org/10.1080/01587910600789522)
- Choi, K. H., Saperstein, A. M., & Medalia, A. (2012). The relationship of trait to state motivation: The role of self-competency beliefs. *Schizophrenia Research*, 139(1-3), 73-77. doi: [10.1016/j.schres.2012.05.001](https://doi.org/10.1016/j.schres.2012.05.001)
- Cole, H. D., & Griffiths, M. D. (2007). Social interactions in massively multiplayer online role-playing gamers. *Cyber Psychology & Behaviour*, 10(4), 575-583. Doi: [10.1089/cpb.2007.9988](https://doi.org/10.1089/cpb.2007.9988)
- Cornillie, F., Thorne, S. L., & Desmet, P. (2012). ReCALL special issue: Digital games for language learning: Challenges and opportunities. *ReCALL*, 24(3), 243-256. doi: [10.1017/S0958344012000134](https://doi.org/10.1017/S0958344012000134)
- Council of Europe (2001). Common European framework of reference for languages: Learning, teaching, assessment. Cambridge University Press. Retrieved from <https://rm.coe.int/16802fc1bf>
- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.) Thousand Oaks, CA: Sage.
- De Byl, P. H. & Hooper, J. (2103). Key attributes of engagement in a gamified learning environment. *Electric Dreams*. Sydney: Proceedings Ascilite Conference 2103, pp.221-230
- De Freitas, S. & Maharg, P. (2011). Digital games and learning: Modelling learning experiences in the digital age. In S. de Freitas & P. Maharg (Ed.), *Digital games and learning* (pp. 17-41). Dordrecht, Netherlands: Springer.

- De Groot, A., & Keijzer, R. (2000). What is hard to learn is easy to forget: The roles of word concreteness, cognate status and word frequency in foreign-language vocabulary learning and forgetting. *Language learning*, 50(1), 1-56. doi: [10.1111/0023-8333.00110](https://doi.org/10.1111/0023-8333.00110)
- De Wilde, V., Brysbaert, M., & Eyckmans, J. (2020). Learning English through out-of-school exposure. Which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition*, 23(1), 171-185. doi:[10.1017/S1366728918001062](https://doi.org/10.1017/S1366728918001062)
- Deci, E. L., & Ryan, R. M. (1985). The general causality orientation scale: Self-determination in personality. *Journal of Research in Personality*, 19(2), 109-134. doi: [10.1016/0092-6566\(85\)90023-6](https://doi.org/10.1016/0092-6566(85)90023-6)
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goals pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. doi: [10.1207/S15327965PLI1104_01](https://doi.org/10.1207/S15327965PLI1104_01)
- Deci, E., & Koestner, R. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125(6), 627-668. doi: [10.1037/0033-2909.125.6.627](https://doi.org/10.1037/0033-2909.125.6.627)
- DeHaan, J. W. (2005). Acquisition of Japanese as a foreign language through a baseball video game. *Foreign language Annals*, 38(2), 278-282. doi:[10.1111/j.1944-9720.2005.tb02492.x](https://doi.org/10.1111/j.1944-9720.2005.tb02492.x)
- DeHaan, J. W., Reed, W. M., & Kuwada, K. (2010). The effects of interactivity with a music video game on second language vocabulary recall. *Journal of Language Learning & Teaching*, 14(2), 74-94. Retrieved from <https://www.researchgate.net/publication/45681693>
- Denhovska, N., Serratrice, L., & Payne, J. (2016). Acquisition of second language grammar under incidental learning conditions: The role of frequency and working memory. *A Journal of Research in Language Studies*, 66(1), 159-190. doi: [10.1111/lang.12142](https://doi.org/10.1111/lang.12142)

- Denny, E. & Weckesser, A. (2019), Qualitative research: What it is and what it is not. *BJOG: An International Journal of Obstetrics and Gynaecology*, 126, 369. doi: [10.1111/1471-0528.15198](https://doi.org/10.1111/1471-0528.15198)
- Deutsch, M. (2011). A theory of cooperation and competition. In P. T. Coleman (Ed.), *Conflict, interdependence and justice: The intellectual legacy of Morton Deutsch* (pp.24-29), Dordrecht, Netherlands: Springer.
- Dev, P. (1997). Intrinsic motivation and academic achievement. *Remedial and Education*, 18(10), 12-19. doi: [10.1177/074193259701800104](https://doi.org/10.1177/074193259701800104)
- Dweck, C. S., & Molden, D. C. (2005). Self-theories: Their impact on competence motivation and acquisition. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 122-140). New York, NY: Guilford Press.
- Ebneyamini, S., & Sadeghi Moghadam, M. R.(2018). Towards developing a framework for conducting case study research. *International Journal of Qualitative Methods*, 17(1), 1-11. doi: [10.1177/1609406918817954](https://doi.org/10.1177/1609406918817954)
- 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. doi: [10.7575/aiac.ijalel.v.6n.4p.52](https://doi.org/10.7575/aiac.ijalel.v.6n.4p.52)
- Egenfeldt-Nielsen, S. (2007). Third generation educational use of computer games. *Journal of Educational Multimedia and Hypermedia*, 16(3), 263-281. Retrieved from <https://proxy.eap.gr/login?url=https://www.proquest.com/scholarly-journals/third-generation-educational-use-computer-games/docview/205853496/se-2?accountid=16059>
- Egenfeldt-Nielsen, S., Tosca, S. P., & Smith, J. H. (2013). *Understanding video games: The essential introduction* (2nd ed.). London, UK: Routledge.

- Elliot, R., & Timulak, L. (2005). Descriptive and interpretive approaches to qualitative research. In J. Miles & P. Gilbert (Eds.), *A handbook of research methods for clinical health and psychology* (pp. 147- 159). Oxford, UK: Oxford University Press.
- Ellis, N. C. (2009). Optimizing the input: Frequency and sampling in usage-based and form-focused learning. In M. H. Long, & C. J. Doughty (Eds.), *The handbook of language teaching*. New Jersey, NJ: Wiley-Blackwell
- Fabricatore, C. (2000). Learning and video games: An unexploited synergy. Proceedings of the in Search of the Meaning of Learning Workshop, Annual Convention of the Association for Educational Communication and Technology (AECT 2000), Long Beach CA,USA. Retrieved from https://www.researchgate.net/publication/228582424_Learning_and_videogames_An_unexploited_synergy
- Fields, D., & Kafai, Y. (2009). A connective ethnography of peer knowledge sharing and diffusion in a tween virtual world. *International Journal of Computer Supported Collaborative Learning* 4(1), 47-68. doi: [10.1007/s11412-008-9057-1](https://doi.org/10.1007/s11412-008-9057-1)
- FitzGerald, J., & Mills, J. (2022). The importance of ethnographic observation in grounded theory research. *Forum: Qualitative Research Sozialforschung*, 23(2), 1-15. doi: [10.17169/fqs-22.2.3840](https://doi.org/10.17169/fqs-22.2.3840)
- Franceschini, S., Trevisan, P., Ronconi, L., Bertoni, S., Colmar, S., Double, K., Facchetti, A., & Gori, S. (2017). Action video games improve reading abilities and visual-to-auditory attentional shifting in english-speaking children with dyslexia. *Scientific Reports*, 7(1), 5863-12. doi: [10.1038/s41598-017-05826-8](https://doi.org/10.1038/s41598-017-05826-8)
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *The American Psychologist*, 56(3), 218-226. doi: [10.1037/0003-066X.56.3.218](https://doi.org/10.1037/0003-066X.56.3.218)
- Fromme, J., & Unger, A. (Ed.). (2012). *Computer games and new media Cultures: A handbook of digital game studies*. Dordrecht, Netherlands: Springer.

- Galvis Guerrero, H. A. (2011). Using video game-based instruction in an EFL program: Understanding the power of video games in education. *Colombia Applied Linguistics* 13 (1), 54-70. doi: [10.14483/22487085.2931](https://doi.org/10.14483/22487085.2931)
- Gass, M. S., Behney, J., & Plonsky, L. (2013). *Second language acquisition: An introductory course* (4th ed.). New York, NY: Routledge.
- Gee, J. P. (2007). *What video games have to teach us about literacy and learning*. Revised and Updated Edition. New York, NY: Macmillan.
- Gerring, J. (2011). The case study: What it is and what it does. In the Oxford Handbook of Political Science: Oxford University Press.
- Ghuman, D., & Griffiths, M. D. (2012). A cross-genre study of online gaming: Player demographics, motivation for play and social interactions among players. *International Journal of Cyber Behaviour, Psychology and Learning*, 2(1), 13-29. Retrieved from https://explore.openaire.eu/search/publication?articleId=core_ac_uk__::22a9567b354b076d5c988249258e8fb1
- Gillham, B. (2005). *Research interviewing: The range of techniques*. Berkshire, UK: Open University Press
- Goertzel, B., Pennachin, C., & Geisweiller, N. (2014). *Engineering general intelligence, part 1: A path to advanced AGI via embodied learning and cognitive synergy*. Paris, France: Atlantis Press.
- Granic, I., Lobel, A., & Engels, Rutger C. M. E. (2014). The benefits of playing video games. *The American Psychologist*, 69(1), 66-78. doi: [10.1037/a0034857](https://doi.org/10.1037/a0034857)
- Graves, M. F. (1986). Chapter 2: Vocabulary learning and instruction. *Review of Research in Education*, 13(1), 49-89. doi: [10.3102/0091732X013001049](https://doi.org/10.3102/0091732X013001049)

- Günzel, S. (2012). The computer game as a medium. In J. Fromme & A. Unger (Eds.), *Computer games and new media Cultures: A handbook of digital game studies*. Dordrecht, Netherlands: Springer
- Horan, J. J. (1996). Effects of computer-based cognitive restructuring on rationally mediated self-esteem. *Journal of Counseling Psychology*, 43(4), 371-375. doi: [10.1037/0022-0167.43.4.371](https://doi.org/10.1037/0022-0167.43.4.371)
- Hulstijn, J. H. (2013). Incidental learning in second language acquisition. In C. A. Chapelle (Ed.), *The encyclopedia of Applied Linguistics* (Vol. 5, pp. 2632-2640). New Jersey, NJ: Willey-Blackwell
- Hwank, G., Wu, P., & Chen, C. (2012). An online game approach for improving students' performance in web-based problem-solving activities. *Computers and Education*, 59(4), 1246-1256. doi: [10.1016/j.compedu.2012.05.009](https://doi.org/10.1016/j.compedu.2012.05.009)
- Iwasaki, I. (2009). Edutainment for EFL classroom: Exploring effective use of audiovisuals. *Hannah Ronshu*, 45, 1-8. Retrieved from <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.473.9035&rep=rep1&type=pdf>
- Izumi, S. (2002). Output, input enhancement, and the noticing hypothesis: An experimental study on ESL relativization. *Studies in Second Language Acquisition*, 24(4), 541-577. doi: [10.1017/S0272263102004023](https://doi.org/10.1017/S0272263102004023)
- Jansari, A. S., Davis, K., McGibbon, T., Firminger, S., & Kapur, N. (2010). When "long-term memory" no longer means "forever": Analysis of accelerated long-term forgetting in a patient with temporal lobe epilepsy. *Neuropsychologia*, 48(6), 1707-1715. doi: [10.1016/j.neuropsychologia.2010.02.018](https://doi.org/10.1016/j.neuropsychologia.2010.02.018)
- Jayasinghe, U. & Dharmaratne, A. (2013). Game based learning vs gamification from the higher education students' perspective. *2013 IEEE International Conference on Teaching Assessment and Learning for Engineering (TALE)* BALI: IEEE, 683-688. doi: [10.1109/TALE.2013.6654524](https://doi.org/10.1109/TALE.2013.6654524)

- Jensen, S. H. (2017). Gaming as an English language learning resource among young children in Denmark. *CALICO Journal*, 34(1), 1-19. doi: [10.1558/cj.29519](https://doi.org/10.1558/cj.29519)
- Johnson, D. W., & Johnson, R. T. (1989). *Cooperation and competition: Theory and research*. Edina, MN: Interaction Book Company.
- Johnson, D. W., & Johnson, R. T. (2018). Cooperative learning: The foundation for active learning. In S. M. Brito (Ed.), *Active learning-beyond the future* (pp.59-70). London, UK: IntechOpen
- Jung, H. S., Kim, K. H., & Lee, C. H. (2014). Influences of perceived product innovation upon usage behaviour for MMORPG: Product capability, technology capability and user centred design. *Journal of Business Research* 67(10), 2171-2178. doi: [10.1016/j.jbusres.2014.04.027](https://doi.org/10.1016/j.jbusres.2014.04.027)
- Kerr, A. (2006). *The business and culture of digital games: Gamework and gameplay*. London, UK: SAGE Publications.
- Khairudin, R., Givi, M. V., Shahrazad, W. W., Nasir, R., & Halim, F. (2011). Effects of emotional contents on explicit memory process. *Pertanika Journal of Social Science and Humanities*, 19, 17-26. Retrieved from <https://www.semanticscholar.org/paper/Effects-of-Emotional-Contents-on-Explicit-Memory-Khairudin-Givi/1afed55d02a4d67ef6313e8d22173e588f41e67f>
- Khatri, A. (2018). Offline gaming vs cloud gaming (online gaming). *National Journal of System and Information Technology*, 11(2), 99-106. Retrieved from <https://proxy.eap.gr/login?url=https://www.proquest.com/scholarly-journals/offline-gaming-vs-cloud-online/docview/2297163829/se-2?accountid=16059>.
- King, D., Delfabbro, P., & Griffiths, M. (2009). Video game structural characteristics: A new psychological taxonomy. *International Journal of Mental Health and Addiction*, 8(1), 90-106. doi: [10.1007/s11469-009-9206-4](https://doi.org/10.1007/s11469-009-9206-4)
- Koufopoulou, P. (2015). *Using computer games to develop young learners' linguistic and cognitive skills* (Master's thesis). EAP, Hellenic Open University, Patras, Greece.

- Kuper, A., Reeves, S., & Levinson, W. (2008). An introduction to reading and appraising qualitative research. *BMJ: British Medical Journal (Online)*, 337, 1-5. doi: 10.1136/bmj.a288
- Laforest, J. (2009). *Safety Diagnostis tool kit for local communities: Guide to organizing semi-structured interviews with key informant, charting a course to safe living* (Vol. 11). Quebec, Canada: Institute National de Santé Publique de Québec in Cooperation with the Ministère de la Sécurité Publique de Québec.
- Landers, R., N. (2014). Developing a theory of gamified learning: Linking serious games and gamification. *Simulation & Gaming*, 45(6), 752-768. doi: [10.1177/1046878114563660](https://doi.org/10.1177/1046878114563660)
- Larkin, M., & Griffiths, M. D. (2002). Experiences of addiction and recovery: The case for subjective accounts. *Addiction Research and Theory*, 10(3), 281-311. doi: [10.1080/16066350211866](https://doi.org/10.1080/16066350211866)
- Laufer, B. H., & Hulstijn, J. H. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics*, 22(1), 1-26. doi: [10.1093/applin/22.1.1](https://doi.org/10.1093/applin/22.1.1)
- Laufer, B., & Hill, M. (2000). What lexical information do L2 learners select in a CALL disctionary and how does it affect word retention. *Language, Learning and Technology*, 3(2), 58-76. Retrieved from <https://eric.ed.gov/?id=ED462834>
- Lefever, S. (2010). *English skills of young learners in Iceland: I started talking English when I was 4 years old. It just bang... just fall into me*. Paper presented at the Menntakvika Conference, Reykjavik, Iceland. Retrieved from <https://netla.hi.is/serrit/2010/menntakvika2010/021.pdf>
- Li, Q., Zhang, T., Wang, B., & Wang, N. (2013). Effects of RPG on middle school players' intrapersonal intelligence. In Z. Pan, A. D. Cheok, W. Mueller & f. Liarokapis (Eds.), *Transactions on edutainment IX* (pp.160-175). Dordrecht, Netherlands: Springer.

- Li, R., Meng, Z., Tian, Z., & Xiao, W. (2021). Modelling Chinese EFL learners' flow experiences in digital game-based vocabulary learning: The roles of learner and contextual factors. *Computer Assisted Language Learning*, 34(4), 483-505. doi: [10.1080/09588221.2019.1619585](https://doi.org/10.1080/09588221.2019.1619585)
- Looi, C. Y., Duta, M., Brem, A., Huber, S., Nuerk, H., & Cohen Kadosh, R. (2016). Combining brain stimulation and video game to promote long-term transfer of learning and cognitive enhancement. *Scientific Reports*, 6(1), 22003-22003. doi: [10.1038/srep22003](https://doi.org/10.1038/srep22003)
- Lune, H., & Berg, B. L. (2017). *Qualitative research methods for the social science* (9th ed.). Essex, UK: Pearson Education Limited.
- Mäyrä, F. (2008). *An introduction to games studies: Games in culture*. Los Angeles, CA: SAGE Publications.
- McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. New York, NY: Penguin Press.
- McGrath, C., Palmgren, P. J., & Liljedahl, M. (2019). Twelve tips for conducting qualitative research interviews. *Medical Teacher*, 4(19), 1002-1006. doi: [10.1080/0142159X.2018.1497149](https://doi.org/10.1080/0142159X.2018.1497149)
- McIntosh, M., & Morse, J. M. (2015). Situating and constructing diversity in semi-structured interviews. *Global Qualitative Nursing Research*, 2, 1-12. doi: [10.1177/2333393615597674](https://doi.org/10.1177/2333393615597674)
- McKeown, M. G., & Beck, I. L. (2014). Effects of vocabulary instruction on measures of language processing: Comparing two approaches. *Early Childhood Research Quarterly*, 29(4), 520-530. doi: [10.1016/j.ecresq.2014.06.002](https://doi.org/10.1016/j.ecresq.2014.06.002)
- Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63, 81-97. doi: [10.1037//0033-295X.101.2.343](https://doi.org/10.1037//0033-295X.101.2.343)

- Mitchell, A., & Savill-Smith, C. (2004). *The use of computer and video games for learning: A review of the literature*. London, UK: Learning and Skills Development Agency.
- Mondada, L. (2007). Commentary: Transcript variations and the indexicality of transcribing practices. *Discourse Studies*, 9(6), 809-821. doi: [10.1177/1461445607082581](https://doi.org/10.1177/1461445607082581)
- Moore, V. J., Prewitt, E. M., Carpenter-McCullough, A., & Whitworth, B. A. (2020). Teamwork makes the dream work: Using team-based learning in the science classroom. *Journal of College Science Teaching*, 49(3), 38-46. doi: [10.2505/4/jcst20_049_03_38](https://doi.org/10.2505/4/jcst20_049_03_38)
- Mulhall, A. (1998). Methods of data collection for quantitative research. In B. Roe & C. Webb (Eds.), *Research and development in clinical nursing practice* (pp. 135-169). London, UK: Whurr Publishers.
- Mulhall, A. (2003). In the field: Notes on observation in qualitative research. *Journal of Advanced Nursing*, 41(3), 306-313. doi: [10.1046/j.1365-2648.2003.02514.x](https://doi.org/10.1046/j.1365-2648.2003.02514.x)
- Musa, J. (2015). Adding new vocabulary while playing casual games: Young people in Brunei as a case study. *Journal of Management Research*, 7(2), 442-450. doi: [10.5296/jmr.v7i2.6939](https://doi.org/10.5296/jmr.v7i2.6939)
- Nagygyörgy, K., Urbán, R., Farkas, J., Griffiths, M. D., Zilahy, D., Kökönyei, G., Mervó, B., Reindl, A., Ágoston, C., Kertész, A., Harmath, E., Oláh, A., & Demetrovics, Z. (2013). Typology and sociodemographic characteristics of massively multiplayer online game players. *International Journal of Human Computer Interaction* 29(3), 192-200. doi: [10.1080/10447318.2012.702636](https://doi.org/10.1080/10447318.2012.702636)
- Najmolhoda F.S., Ghanbarpour Z., & Haghani F. (2015). Investigating and explaining language learning theories in psychology. *International Journal of Education and Psychological Researches*, 1, 67-70. doi: [10.4103/2395-2296.152213](https://doi.org/10.4103/2395-2296.152213)

- Navarro Lobato, I., Masmudi-Martin, M., Quiros-Ortega, M. E., Gaona-Romero, C., Carretero-Rey, M., Rey Blanes, C., & Khan, Z. U. (2021). 14-3-3ζ is crucial for the conversion of labile short-term object recognition memory into stable long-term memory. *Journal of Neuroscience Research*, 99(9), 2305-2317. doi: [10.1002/jnr.24894](https://doi.org/10.1002/jnr.24894)
- Noe, P. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology*, 39(3), 497-523. doi: [10.1111/j.1744-6570.1986.tb00950.x](https://doi.org/10.1111/j.1744-6570.1986.tb00950.x)
- Noels, K. A., Pelletier, L. G., Clément, R., & Vallerand, R. J. (2000). Why are you learning a second language? Motivational and self-determination theory. *Language Learning*, 50(1), 57-85. doi: [10.1111/0023-8333.00111](https://doi.org/10.1111/0023-8333.00111)
- Osterweil S. & Klopfer E., 2011. Are games all child's play? In S. de Freitas & P. Maharg (Ed.), *Digital games and learning* (pp. 152-171), London, UK: Bloomsbury Publishing.
- Papanastasiou, G., Drigas, A., & Skianis, C. (2017). Serious games in preschool and primary education: Benefits and impacts on curriculum course syllabus. *International Journal of Emerging Technologies in Learning*, 12(1), 44. doi: [10.3991/ijet.v12i01.6065](https://doi.org/10.3991/ijet.v12i01.6065)
- Pasfield-Neofitou, S. (2014). Language learning and socialization opportunities in game worlds: Trends in first and second language research. *Language and Linguistics Compass*, 8(7), 271-284. doi: [10.1111/lnc3.12083](https://doi.org/10.1111/lnc3.12083)
- Pekrun, R. (1992). The impact of emotions on learning and achievement: Towards a theory of cognitive/motivational mediators. *Applied Psychology*, 41(4), 359-376. doi: [10.1111/j.1464-0597.1992.tb00712.x](https://doi.org/10.1111/j.1464-0597.1992.tb00712.x)
- Pellicer-Sánchez, A. (2016). Incidental L2 vocabulary acquisition from and while reading: An eye-tracking Study. *Studies in Second Language Acquisition*, 38(1), 97-130. doi: 10.1017/S0272263115000224.

- Pessoa, L. (2008). On the relationship between emotion and cognition. *Nature Reviews*, 9(8), 148-158. doi: [10.1038/nrn2317](https://doi.org/10.1038/nrn2317)
- Piaget, J. (1973). *To understand is to invent*. New York, NY: Grossman.
- Pierce, G. L., & Cleary, P. F. (2014; 2016;). The K-12 educational technology value chain: Apps for kids, tools for teachers and levers for reform. *Education and Information Technologies*, 21(4), 863-880. doi: [10.1007/s10639-014-9357-1](https://doi.org/10.1007/s10639-014-9357-1)
- Pohl, C., Rist, S., Zimmermann, A., Fry, P., Gurung, G. S., Schneider, F., Speranza, C. I., Kiteme, B., Boillat, S., Serrano, E., Hadorn, G. H., & Wiesmann, U. (2010;2017;). Researchers' roles in knowledge co-production: Experience from sustainability research in kenya, switzerland, bolivia and nepal. *Science and Public Policy*, 37(4), 267-281. doi: [10.3152/030234210X496628](https://doi.org/10.3152/030234210X496628)
- Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice*. Philadelphia, PA: Lippincott Williams and Wilkins.
- Poo, M., Pignatelli, M., Ryan, T. J., Tonegawa, S., Bonhoeffer, T., Martin, K. C., Rudenko, A., Tsai, L., Tsien, R. W., Fishell, G., Mullins, C., Gonçalves, J. T., Shtrahman, M., Johnston, S. T., Gage, F. H., Dan, Y., Long, J., Buzsàki, G., & Stevens, C. (2016). What is memory? The present state of the engram. *BMC Biology*, 14(40), 40. doi: [10.1186/s12915-016-0261-6](https://doi.org/10.1186/s12915-016-0261-6)
- Prensky, M. (2002). *What kids learn that's positive from playing video games*: Simon Fraser: University, Surrey Campus Library
- Rahimi Esfahani, F., Rafizade Tfti, M. R., & Hajjilili, M. (2019). The impact of digital games on intermediate EFL learners' vocabulary improvement. *International Journal of Research Studies in Language Learning*, 8(1),29-38. doi: [10.5861/ijrsl.2019.3013](https://doi.org/10.5861/ijrsl.2019.3013)
- Ramirez, D., & Squire, K. (2015). Gamification and learning. In Walz & Deterding (Eds.), *The gameful world: Approaches, Issues, Applications* (pp. 629-652).Cambridge, MA: The MIT Press

- Reasons why socializing and play is important for children* (2020). Retrieved from <https://www.gantrykids.com/reasons-why-socializing-and-play-is-important-for-children>
- Reeves, S., Kuper, A., & Hodges, B. D. (2008). Qualitative research: Qualitative research methodologies: Ethnography. *BMJ (Online)*, 337(7668), 512-514. doi: [10.1136/bmj.a1020](https://doi.org/10.1136/bmj.a1020)
- Reinders, H. (2017). Digital games and second language learning. In S. T. Thorne & S. May (Eds.), *Language, education and technology. Encyclopedia of language education (3rd ed.)*. Dordrecht, Netherlands: Springer.
- 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). New York, NY: Macmillan.
- Resnick, 2004. Edutainment? No thanks. I prefer playful learning. *Associazione Cicita*, 1(1), 2-4. Retrieved from <https://web.media.mit.edu/~mres/papers/edutainment.pdf>
- Restrepo Ramos, F. D. (2015). Incidental vocabulary learning in second language acquisition: A literature review. *Profile Issues in Teachers' Professional Development*, 17(1), 157-166. doi: [10.15446/profile.v17n1.43957](https://doi.org/10.15446/profile.v17n1.43957)
- Rice, L. (2009). Playful learning. *Journal for Education in the Built Environment*, 4(2), 94-108. doi: [10.11120/jebe.2009.04020094](https://doi.org/10.11120/jebe.2009.04020094)
- Richards, L., & Morse, J. M. (2013). *Readme first for a user's guide to qualitative methods (3rd ed.)*. Thousand Oaks, CA: SAGE
- Richardson-Klavehn, A. R., & Bjork, R. A. (2003). Memory, long-term. In L. Nadel (Ed.), *encyclopedia of cognitive science* (Vol. 2, pp. 1096-1105). London, UK: Nature Publishing Group.

- Rubin, J., & Thompson, I. (1994). *How to become a more successful language learner*. Boston, MA: Heinle & Heinle.
- Rudis, D. & Poštić, S. (2018). Influence of video games on the acquisition of the English language. *Verbum*, 80, 112-118. doi: [10.15388/Verb.2017.8.11354](https://doi.org/10.15388/Verb.2017.8.11354)
- Ryan, F., Coughlan, M., & Cronin, p. (2009). Interviewing in qualitative research: The one to one research. *International Journal of Therapy and Rehabilitation*, 16(6), 309-312. doi: 10.12968/ijtr.2009.16.6.42433
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and Emotion*, 30(4), 344-360. doi: [10.1007/s11031-006-9051-8](https://doi.org/10.1007/s11031-006-9051-8)
- Ryu, D. (2013). Play to learn, learn to play: Language learning through gaming culture. *European Association for Computer Assisted Language Learning*, 25(2), 286-301. doi: [10.1017/S0958344013000050](https://doi.org/10.1017/S0958344013000050)
- Salen, K., & Zimmerman, E. (2004). *Rules of play: Game design fundamentals*. Cambridge, MA: MIT Press.
- Sandelowski, M. (2002). Reembodying qualitative inquiry. *Qualitative Health Research*, 12(1), 104-115. doi: [10.1177/1049732302012001008](https://doi.org/10.1177/1049732302012001008)
- Sandiuc, C. (2019). The use of vocabulary games in ESP classroom. *Scientific Bulletin "Mirea Cel Batran" Naval Academy*, 22(1), 1-9. doi: [10.21279/1454-864X-19-11-014](https://doi.org/10.21279/1454-864X-19-11-014)
- Schutz, P. & DeCuir J. (2002). Inquiry on emotions in education. *Educational Psychologist*, 37(2), 125-134. doi: [10.1207/S15326985EP3702_7](https://doi.org/10.1207/S15326985EP3702_7)
- Shabaneh, Y., & Farrah, M. (2019). The effect of games on vocabulary retention. *Indonesian Journal of Learning and Instruction*, 2(1), 79-90. doi: [10.25134/ijli.v2i01.1687](https://doi.org/10.25134/ijli.v2i01.1687)

- Singer, D., Michnick Gilinkoff, R., & Hirsh-Pasek, K. (2006). *Play = learning: How play motivates and enhances children's cognitive and social-emotional growth*. Oxford, UK: Oxford University Press.
- Sinkovics, R. R., & Alfoldi, E. A. (2012). Progressive focusing and trustworthiness in qualitative research: The enabling role of computer-assisted qualitative data analysis software (CAQDAS). *Management International Review*, 52(6), 817-845. doi: [10.1007/s11575-012-0140-5](https://doi.org/10.1007/s11575-012-0140-5)
- Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. *Health Psychology Review*, 5(1), 9-27. doi: [10.1080/17437199.2010.510659](https://doi.org/10.1080/17437199.2010.510659)
- Smith, J. A. (2015). *Qualitative psychology: A practical guide to research methods*. London, UK: Sage Publications Ltd.
- Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis theory: Theory, method and research*. London, UK: Sage Publications Ltd.
- Smith, K. (2009). Reprint September 1979: Learning together and alone: Cooperation, competition and individualization. *NACTA Journal*, 53(3), 71-74. Retrieved from <https://www.proquest.com/docview/214374118?OpenUrlRefId=info:xri/sid:summon&accountid=16059>
- Smith, P. K. (2010). *Children and play*. New Jersey, NJ: Wiley-Blackwell.
- Spires, H. A. (2015). Digital game-based learning. *Journal of Adolescent & Adult Literacy*, 59(2), 125-130. doi: [10.31695/IJASRE.2018.33016](https://doi.org/10.31695/IJASRE.2018.33016)
- Steinkuehler, C., Squire, K., & Barab, S. (2012). *Games, learning and society: Learning and meaning in the digital age*. Cambridge, UK: Cambridge University Press.
- Stenberg, R. J., & Powell, J. S. (1983). Comprehending verbal comprehension. *American Psychologist*, 38(8), 878-893. doi: [10.1037/0003-066X.38.8.878](https://doi.org/10.1037/0003-066X.38.8.878)

- Sternberg, R. J., & Sternberg, K. (2011). *Cognitive psychology* (6th ed.). Belmont, CA: Wadsworth.
- Sternberg, R. J., Powell, J. S., & Kaye, D. B. (1983). Teaching vocabulary building skills: A contextual approach. In A. C. Wilkinson (Ed.), *Classroom computers and cognitive science* (pp. 122-141), New York, NY: Academic Press.
- Steuer, J. (1992). Defining virtual reality: Dimension determining telepresence. *Journal of Communication*, 42(4), 73-93. doi: [10.1111/j.1460-2466.1992.tb00812.x](https://doi.org/10.1111/j.1460-2466.1992.tb00812.x)
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Newbury Park, CA: SAGE.
- Subon, F. (2016). Direct vocabulary instruction: The effects of contextualized word families on learners' vocabulary acquisition. *Procedia-Social and Behavioral Sciences*, 224, 284-291. doi: [10.1016/j.sbspro.2016.05.461](https://doi.org/10.1016/j.sbspro.2016.05.461)
- Suharno, S. (2010). Cognitivism and its implication in the second language learning. *PAROLE: Journal of Linguistics and Education*, 1, 72-96. doi: [10.14710/parole.v1i0.72-96](https://doi.org/10.14710/parole.v1i0.72-96)
- Sutton, J., & Austin, Z. (2015). Qualitative research: Data collection, analysis and management. *Canadian Journal of Hospital Pharmacy*, 68(3), 226-231. doi: [10.4212/cjhp.v68i3.1456](https://doi.org/10.4212/cjhp.v68i3.1456)
- Swain, M. (2013). The inseparability of cognition and emotion in second language learning. *Language Teaching*, 46(2), 195-207. doi: [10.1017/S0261444811000486](https://doi.org/10.1017/S0261444811000486)
- Swanson, E. A., & Howerton, D. (2007). Influence vocabulary acquisition for English language learners. *Intervention in School and Clinic*, 42(5), 290-294. doi: [10.1177/10534512070420050501](https://doi.org/10.1177/10534512070420050501)
- Swanson, H. L., Zheng, X., & Jerman, O. (2009). Working memory, short term memory, and reading disabilities: A selective meta-analysis of the literature. *Journal of Learning Disabilities*, 42(3), 260-287. doi: [10.1177/0022219409331958](https://doi.org/10.1177/0022219409331958)

- Tamborini, R., & Skalski, P. (2006). The role of presence in the experience of electronic games. In P. Vorderer & Bryant (Eds.), *Playing computer games: Motives, responses and consequences*. London, UK: Routledge
- Thornbury, S. (2002). *How to teach vocabulary*. Essex, UK: Pearson Education Limited.
- Tseng, H. W., & Yeh, H. (2013). Team members' perceptions of online teamwork learning experiences and building teamwork trust: A qualitative study. *Computers and Education*, 63, 1-9. doi: [10.1016/j.compedu.2012.11.013](https://doi.org/10.1016/j.compedu.2012.11.013)
- Turgut, Y., & Irgin, P. (2009). Young learners' language learning via computer games. *Procedia Social and Behavioural Sciences*, 1(1), 760-764. doi: [10.1016/j.sbspro.2009.01.135](https://doi.org/10.1016/j.sbspro.2009.01.135)
- Tyng, C., Amin, H. U., Saad, M. N. M., & Malik, A. S. (2017). The influences of emotion on learning and memory. *Frontiers in Psychology*, 8, 1454. doi: [10.3389/fpsyg.2017.01454](https://doi.org/10.3389/fpsyg.2017.01454)
- Van Maanen, J. (1998). Different strokes: Qualitative research in the administrative science quarterly from 1956-1996. In J. Van Maanen (Eds.), *Qualitative studies of organizations* (pp. ix-xxxiii). Thousand Oaks, CA: Sage Publications.
- Van Ommen, M. (2018). Guild wars 2, the Frankfurt school and dialectical fairy scenes: A critical approach towards massively multiplayer online video games. *Games and Culture*, 13(6), 547-567. doi: [10.1177/1555412015627392](https://doi.org/10.1177/1555412015627392)
- Vogel, S., & Schwabe, L. (2016). Learning and memory under stress: Implications for the classroom. *NPJ Science of Learning*, 1(1), 16011. doi: [10.1038/npjscilearn.2016.11](https://doi.org/10.1038/npjscilearn.2016.11)
- Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press
- Walshe, C., Ewing, G., & Griffiths, J. (2012). Using observation as a data collection method to help understand patient and professional roles and actions in palliative care settings. *Palliative Medicine*, 26(8), 1048-1054. doi: [10.1177/0269216311432897](https://doi.org/10.1177/0269216311432897)

- Walz, S. P., & Deterding, S. (Ed.), (2016). *The gameful world: Approaches, Issues, Applications*. Cambridge, MA: The MIT Press.
- Wang, F., & Burton J. K. (2010). Making digital game-based learning work: Domain knowledge transparency. *Journal of Educational Technology* 6(4), 8-16. Retrieved from <https://eric.ed.gov/?id=EJ1098358>
- Weibel, D., Wissmath, B., Habegger, S., Steiner, Y., & Groner, R. (2008). Playing online games against computer- vs. human controlled opponents: Effects on presence, flow, and enjoyment. *Computer in Human Behavior* 24(5), 2274-2291. doi: [10.1016/j.chb.2007.11.002](https://doi.org/10.1016/j.chb.2007.11.002)
- Whitton, N. (2010). *Learning with digital games : A practical guide to engaging students in higher education*. London, UK: Routledge.
- Wolf, D. K. (2012). The instructional design and motivational mechanisms of World of Warcraft. In J. Fromme & A. Unger (Eds.), *Computer games and new media Cultures: A handbook of digital game studies* (pp. 557-569). Dordrecht, Netherlands: Springer.
- Yin, R. K. (2014). *Case study research. Design and methods* (4th ed.). London, UK: Sage Publications.
- Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan*, 5(1), 1-6. Retrieved from <https://jurnalkemanusiaan.utm.my/index.php/kemanusiaan/article/view/165>

Appendix 1: Written Consent

Αξιότιμοι γονείς,

Στα πλαίσια της Διπλωματικής μου Εργασίας για το Μεταπτυχιακό «Διδακτική της Αγγλικής ως Ξένης, Διεθνούς Γλώσσας» του Ελληνικού Ανοικτού Πανεπιστημίου πραγματοποιώ μια έρευνα σχετικά με τον εμπλουτισμό λεξιλογίου μέσα από τη χρήση μαζικών διαδικτυακών παιχνιδιών πολλαπλών παικτών κατά τη διάρκεια του ελεύθερου χρόνου των εφήβων.

Θα με τιμούσε ιδιαίτερα εάν δίνετε τη συγκατάθεσή σας να συμμετάσχει ο έφηβος γιος σας στην έρευνα μου. Κατά τη διάρκεια της έρευνας θα πρέπει να μου παραχωρηθεί μια συνέντευξη από το γιο σας καθώς επίσης και να τον παρατηρήσω να παίζει μαζικά διαδικτυακά παιχνίδια πολλαπλών παικτών στον ελεύθερό του χρόνο. Ο στόχος είναι να μπορέσω να κατανοήσω αν η χρήση τέτοιου είδους παιχνιδιών μπορεί να βοηθήσει εφήβους να μάθουν λεξιλόγιο, το οποίο μετέπειτα θα δύνανται να χρησιμοποιήσουν οποτεδήποτε χρειαστεί. Η όλη διαδικασία θα είναι απόλυτα εμπιστευτική και ανώνυμη και θα ακολουθήσει κατά γράμμα τον κώδικα δεοντολογίας του Πανεπιστημίου. Σας παρακαλώ, λοιπόν, να συναινέσετε στην ηχογράφηση της συνέντευξης και στην παρατήρηση που θα διεξαχθούν στα πλαίσια της εν λόγω εργασίας. Επίσης θα ήθελα να σας αναφέρω ότι η συμμετοχή είναι προαιρετική.

Με εκτίμηση,

Τσέλιου Χριστίνα

Υπογραφή Γονέων:

Appendix 2: The Semi-Structured Interview

Καλησπέρα. Θα χρειαστώ τη βοήθειά σου για τη διπλωματική μου εργασία στο πανεπιστήμιο. Γι' αυτό το λόγο θα ήθελα να κάνουμε μια συνέντευξη. Αυτό που πρέπει να θυμάσαι καθ' όλη τη διάρκεια της συνέντευξης είναι ότι δεν υπάρχουν σωστές ή λανθασμένες απαντήσεις στις ερωτήσεις που θα σου κάνω. Επίσης θα σε παρακαλέσω είναι να είσαι ειλικρινής και να εκφράσεις τη γνώμη σου χωρίς ενδοιασμούς ή δευτερες σκέψεις. Σ' ευχαριστώ πολύ για τη συνεργασία. Αυτή η συνέντευξη μπορεί να γίνει είτε στα Αγγλικά είτε στα Ελληνικά. Τι προτιμάς;

Ελληνικά

Πόσο χρονών είσαι;

12

Προσδιόρισε το φύλο σου.

Αγόρι. Είμαι αγόρι

Ζεις σε πόλη ή χωριό;

Ζω σε πόλη. Στην Αθήνα.

Πόσα χρόνια μαθαίνεις Αγγλικά;

Εεε...8 και πάω πρώτη Γυμνασίου.

Διδάσκεισαι Αγγλικά μόνο στο σχολείο ή και από κάποιον άλλο φορέα εκπαίδευσης;

Και στο σχολείο και από κάποιον άλλο φορέα εκπαίδευσης.

Προσδιόρισε.

Αρχικά έκανα και αγγλικά σε φροντιστήριο με τους φίλους μου, αλλά τώρα έχω μπλέξει με μια καθηγήτρια σε ιδιαίτερα.

Παίζεις ηλεκτρονικά παιχνίδια;

Ε τα αγγίζω πότε πότε. Ναι παίζω εντάξει... εντάξει μου αρέσουν .

Γιατί σου αρέσει να παίζεις ηλεκτρονικά παιχνίδια;

Χαλαρώνω και ξεφεύγω από τη ρουτίνα μου.

Τι εννοείς ξεφεύγεις από τη ρουτίνα σου?

Από την καθημερινότητα μου και τις επίπονες δραστηριότητες μου. Τώρα ειδικά με τις εξετάσεις να πλησιάζουν είναι χαλαρωτικό να παίζω με τους φίλους μου και να συνομιλούμε.

Πόσο από τον ελεύθερό σου χρόνο αφιερώνεις στα ηλεκτρονικά παιχνίδια;

Εεεε... Τώρα γενικά περίπου 1.5 με 3 ώρες τα σαββατοκύριακα.

Και τις καθημερινές?

Καθημερινές δεν παίζω βιντεοπαιχνίδια.

Οπότε όταν λες 3 ώρες εννοείς στο σύνολο και για όλες τις μέρες ή την κάθε μέρα;

Εντάξει μπορεί να ξεφύγει λίγο. Περίπου 3 με 4 ώρες αλλά στο σύνολο για όλο το σαββατοκύριακο.

Προτιμάς να παίζεις online ή offline;

Online με τους φίλους μου.

Γιατί σου αρέσει να παίζεις με τους φίλους σου;

Έχει περισσότερη αγωνία και περισσότερη πλάκα γιατί αλληλεπιδρώ με κανονικούς παίκτες οι οποίοι μπορεί να είναι και καλύτεροι από μένα και έτσι το παιχνίδι δεν είναι βαρετό. Οπότε γι' αυτό διαλέγω να παίζω με τους φίλους μου.

Δηλαδή το να είσαι σε μια ομάδα εσένα σε βοηθάει.

Ναι.

Τα παιχνίδια που παίζεις είναι στα Αγγλικά ή στα Ελληνικά;

Όλα είναι στα αγγλικά. Δεν υπάρχει ελληνικό παιχνίδι νομίζω και συνήθως δεν υπάρχει τίποτα στα ελληνικά μέσα στο παιχνίδι.

Θεωρείς ότι τα ηλεκτρονικά παιχνίδια μπορούν να σε βοηθήσουν να εμπλουτίσεις το λεξιλόγιό σου;

Μέχρι και ένα επίπεδο ναι.

Συναντάς συχνά άγνωστες λέξεις;

Πάντα. Το παιχνίδι είναι βασισμένο στην αγγλική γλώσσα οπότε είναι λογικό πάντα να βρίσκω άγνωστες λέξεις.

Οι άγνωστες λέξεις που συναντάς σε δυσκολεύουν όταν παίζεις;

Αν μιλάμε για τις λέξεις που συναντούσα στο παρελθόν όχι γιατί πλέον τις έχω ενσωματώσει στο λεξιλόγιό μου.

Αν όμως συναντήσεις μια καινούρια, τελείως άγνωστη προσπαθείς να καταλάβεις τη σημασία της ή την αγνοείς;

Ναι γιατί θα με βοηθήσει προφανώς στο μέλλον. Όχι το μέλλον το δικό μου, το μέλλον στο παιχνίδι εννοώ.

Σε βοηθούν οι γνώσεις που ήδη έχεις, οι εικόνες και οι ήχοι του παιχνιδιού να καταλάβεις τη σημασία των άγνωστων λέξεων;

Ναι με βοηθάνε οι εικόνες, οι ήχοι και τα συμφραζόμενα από τις προτάσεις μέσα στις οποίες βρίσκονται.

Όταν λες συμφραζόμενα τι εννοείς; Από πού βγαίνουν αυτά τα συμφραζόμενα;

Συνήθως δεν είναι μόνη της μια λέξη. Είναι μέσα σε μια πρόταση ας πούμε, οπότε είναι και πιο εύκολο.

Οπότε σε βοηθούν, για να το καταλάβω καλύτερα και ο ήχος και η εικόνα αλλά και η πρόταση μέσα στην οποία χρησιμοποιείται η λέξη. Κατάλαβα σωστά;

Πολύ σωστά.

Έχεις ψάξει ποτέ τη σημασία άγνωστων λέξεων σε κάποιο λεξικό, είτε στο κινητό σου online είτε ή έντυπο, σε βιβλίο;

Όχι.

Ποτέ;

Ποτέ.

Έχουν υπάρξει περιπτώσεις που σε βοήθησαν οι συμπαίκτες σου να καταλάβεις τη σημασία λέξεων που συναντάς για πρώτη φορά;

Ναι, γιατί είναι λέξεις τις οποίες δεν έχω ξανακούσει στο παρελθόν και εντάξει ρωτάω.

Άρα αυτό που κάνεις είναι να ρωτάς εκείνους τι σημαίνει.

Ναι ναι.

Γιατί ρωτάς εκείνους;

Γιατί είτε ξέρουν καλύτερα Αγγλικά από μένα και θα ξέρουν τι σημαίνει μια λέξη, είτε θα έχουν παίξει ξανά το παιχνίδι και θα την έχουν συναντήσει ξανά. Οπότε θα μου πουν τι να κάνω.

Σε έχει βοηθήσει η μητρική σου γλώσσα να καταλάβεις τη σημασία άγνωστων λέξεων;

Γενικά τα Ελληνικά νομίζω είναι μια γλώσσα η οποία δεν έχει και πολύ σχέση με καμία άλλη. Ουσιαστικά δεν ξέρω καν αν υπάρχουν κοινές λέξεις, ή εάν υπάρχουν είναι ελάχιστες οπότε όχι.

Δεν έχει τύχει λοιπόν να συναντήσεις μια λέξη που να ακούγεται το ίδιο και στις δύο γλώσσες, οπότε να μπορέσεις να συνδυάσεις.

Αν τυχόν τύχει αυτό σημαίνει ότι υπάρχει στην αγγλική έτσι και την έχουμε προσαρμόσει εμείς στην ελληνική. Ας πούμε cabin ... καμπίνα.

Τέτοιου είδους παραδείγματα έχει τύχει να συναντήσεις;

Ναι ναι εντάξει.

Πιστεύεις ότι παίζοντας ένα παιχνίδι πολλές φορές σε βοηθάει να καταλάβεις τη σημασία λέξεων που πιθανόν δε γνωρίζεις ή αρχικά δεν την είχες προσέξει η πιθανόν την είχες αγνοήσει;

Ναι εντάξει.

Με ποιό τρόπο;

Κοιτάζτε όσες ποιο πολλές λέξεις συναντάω και όσο πιο πολύ παίζω επηρεάζει κιόλας γιατί συνήθως οι λέξεις που υπάρχουν είναι σημαντικές και καθοριστικές για το παιχνίδι και την έκβασή του.

Τι σημασίας έχει όμως το πόσες φορές θα παίξεις το ίδιο παιχνίδι ή την ίδια πίστα για να καταλάβεις τη σημασία της λέξης;

Συνήθως η εμπειρία σε βοηθάει να την καταλάβεις καλύτερα. Δε νομίζω με την πρώτη φορά να την καταλάβουμε τόσο εύκολα. Χρειάζεται αρκετές φορές.

Όταν λες πολλές φορές τι εννοείς;

Εννοώ πολλές φορές. Αλλά συνήθως και στα online παιχνίδια δεν υπάρχουν πίστες και πολλές φορές. Οπότε κατά κύριο λόγο συναντάται αυτό το φαινόμενα στα offline παιχνίδια αλλά δεν μπορώ να είμαι και σίγουρος γιατί δεν παίζω και συχνά offline.

Θεωρείς ότι γνωρίζεις τις λέξεις που συναντάς και καταλαβαίνεις τη σημασία τους μέσα από το παιχνίδι;

Ναι την ξέρω και πολλές φορές τη χρησιμοποιώ και στο μέλλον για να το χρησιμοποιώ ως πλεονέκτημα και να λέω ότι τα παιχνίδια βοηθάνε και κάπου.

Άρα δε χρειάζεται να την δεις παραπάνω από μια φορές για να σου μείνει και να μπορείς να τη θυμηθείς;

Όχι δε χρειάζεται.

Πόσες φορές θεωρείς ότι πρέπει να συναντήσεις την ίδια λέξη προκειμένου να μπορέσεις να την θυμηθείς;

Μια με δυο φορές το πολύ είναι αρκετές.

Πώς είσαι σίγουρος ότι πλέον γνωρίζεις αυτές τις λέξεις;

Για να με βοηθάνε και στο μέλλον τις αποθηκεύω στο μυαλό μου... στην άκρη του μυαλού μου.

Σε περίπτωση που συναντήσεις μια από αυτές τις λέξεις σε κάποιο κείμενο, σε κάποιο βίντεο ή σε μια συζήτηση θα μπορέσεις να την αναγνωρίσεις και να θυμηθείς τη σημασία της;

Ναι ναι ναι. Ναι γιατί θα θυμηθώ το παράδειγμα που έχω συναντήσει στα παιχνίδια και θα την αποδώσω τη λέξη αυτή.

Έχει τύχει να χρησιμοποιήσεις λέξη που έμαθες από τα ηλεκτρονικά παιχνίδια όταν μιλάς ή όταν γράφεις;

Έχει τύχει.

Θυμάσαι κάποιο παράδειγμα;

Εεε early access.

Πού την έχεις συναντήσει αυτή τη φράση;

Σε ένα βιντεοπαιχνίδι.

Και πού τη χρησιμοποίησες; Για να μιλήσεις με κάποιον φίλο; Για να γράψεις κάτι;

Για να γράψω μια έκθεση για το μάθημα αγγλικών μου.

Έχεις κάτι να προσθέσεις;

Όχι.

Σ' ευχαριστώ πολύ

Appendix 3: Observation Predetermined Aspects

- Does the participant play with friends or people they don't know?

.....

.....

.....

- What is the language used in the game?

.....

.....

.....

- What is the language used between co-players when interacting?

.....

.....

.....

- What form of communication does the participant choose to have with his co-players?

.....

.....

.....

- Does the participant try to understand the meaning of unknown words or does he ignore them?

.....

.....

.....

- Does the game provide the participant with enough resources in order to derive meaning? Which are they?

.....

.....

.....

- How does the participant make use of those resources?

.....

.....

.....

- Does the participant use other resources that help them to understand the meaning of unknown words? Which are they and how are they used?

.....

.....

.....

- Does the participant experiment with the unknown words within the game environment in order to understand their meaning? How?

.....

.....

.....

- Does the participant rely on cognates in order to derive meaning?

.....

.....

.....

- Can the participant recall the meaning of an unknown word after seeing and deriving its meaning only once?

.....

.....

.....

- After how many times of seeing new vocabulary on average is the participant able to recall its meaning?

.....

.....

.....

- Did the participant use words they were able to recall in any way during the game?
Describe.

.....

.....

.....

- Was it in a spoken or written form?

.....

.....

.....

- Have they acquired new vocabulary? How do you know?

.....

.....

.....

Appendix 4: Observation Comprehensive Notes

First Observation

The participant was seated comfortably in his own bedroom wearing casual clothes. They started playing solo a MMOG online on PlayStation because none of his friends was online at that time. The language used in the game was English both for the game instructions and for the characters' descriptions. The first unknown word he encountered was "harvesting tool". He was familiar with the meaning of the word "tool", but he didn't know the meaning of the word "harvesting". As this was one of the character's weapons, the word was accompanied by an image of a billhook. So the participant related the meaning of "harvesting tool" to the billhook without searching for more information regarding the meaning. After about 10 minutes of playing a friend of his logged in the game and sent him a request, which was accepted, to play as a team. For that reason the participant connected a microphone to be able to communicate orally with his friend. The language they used to communicate was mainly their native. However, as far as some steps, actions or items related to the game were concerned they used the used English terms, being fully aware of their meaning. What they seemed to ignore was words they didn't know and which did not directly affect their gameplay like names of areas within the game. At some point they encountered the word "mentality". The participant's first reaction was to ask his friend whether he knew the meaning of the word, but the answer was negative. So, the participant used his background knowledge in order to derive meaning. He related the word "mentality" to the word "mental", which he was aware of, and managed to understand the former's meaning. One of the game instructions provided asked the participant to "extract poison". Neither the participant nor his friend knew the meaning of the word "extract" and the context provided by the instructions was not of assistance. So, they agreed on trying different actions to see what would work. First they burnt the tree on the screen, but the instructions remained the same. Then they tried again, this time they cut the tree down using the billhook one of the characters was carrying. The third time the participant suggested cutting one of the fruit on the tree and then using another of his character's tools in order to extract the fruit's juice. At this point both realized the meaning of the word "extract". The participant didn't use any kind of dictionary (digital or print) during the gameplay and no cognates were encountered. As far as memory and retrieval are concerned, the participant was able to recall the meaning of

words he encountered during the gameplay after seeing them once or twice, especially when these words were important for the gameplay. This was proved by the fact that the participant used the English terms to refer to these words while talking to his friend, whenever he thought that the items and actions they represented were required to proceed in the game. These words were used only while speaking, as there was no written communication between the two players.

Second Observation

The participant was in his bedroom feeling comfortable, enjoying a fresh juice and wearing casual clothes. He started playing the same MMOG online solo this time because none of his friends was logged in the game at that time. While talking to himself he wondered whether it would be a good idea to play with people he didn't know, but he directly rejected this idea as his parents' only condition to allow him to play is never to talk to strangers in the virtual world. He was afraid that if his mother found out, they would give him a lecture about it. Once again all the instructions and descriptions provided by the game were in English. Since the participant played solo there was no kind of interaction between him and another player. The only form of communication observed was when he talked to himself expressing his feelings or referring to the steps and action he considered necessary to win the game. When referring to these steps or items he used English terms, whereas when he expressed his feelings he used his native language (L1). There were no cases of ignored unknown words. On the contrary, during the gameplay when he encountered the word "big shield", which was unknown to him, he directly related the word to the image presented and he was able to understand its meaning. The same happened with the word "royal chest" which was used in a sentence offering instructions to the participant on what to do. The instruction said "Open the royal chest and collect, solve the riddle and collect the rewards". His first reaction was to use his background knowledge. He knew that one of the meanings of the word "chest" was referred to a body part, but the context in which the term was used and the visual offered led him to reject his first thought. Another example of the same method used was with the word "fishing rod". It was offered as a tool to his character by the game in order to catch and ride a shark. So, when he saw the word on the screen and the item presented, he was able to associate them. One of the unknown words the participant encountered was "klomberry" which was represented as some sort of berry by a visual. Even though such a

term does not exist, the participant was satisfied by the meaning the visual offered and did not seek for more information on the term from another resource, thinking he fully understood the meaning of the term and accepting it as real. During this observation the participant did not experiment through the game with new vocabulary as he did not have to try multiple times to follow the same instruction. He was assisted either by context or visuals to derive meaning. The fact that the same instructions and visuals were presented multiple times during the gameplay assisted the participant to retain new vocabulary. After some time he was able to perform the necessary actions without looking at the instructions or the words representing the items. He also used new vocabulary and some of the vocabulary he learnt during the previous observation to talk to himself, using the English terms while seeking for them in the game environment. An example was with the word "harvesting tool" which the participant encountered during the previous observation. While playing he had to use a billhook to pull down a wooden wall. So, when he opened his character's backpack he started repeating loudly in English "...harvesting tool... harvesting tool. I know you are here somewhere".

Third Observation

The participant chose to play in the living room this time as he was home alone. The only other member of the family was his older brother. So, he considered it was a very good opportunity for him to lie on the couch while playing a MMOG. He started playing online but solo, even though some of his friends sent him a request to play together as a team. He seemed a bit tired and stressed, so my feeling was that he wanted to enjoy some time alone. As a result, there was no interaction either spoken or written with other players. His only interaction was with the game through the instructions and the directions he was requested to follow in order to succeed in the quests. He also enjoyed talking to himself, commenting on his opponents' actions in the game environment and on the steps he had to take in order to win. The language used by the game to give instructions, directions and resources was English. Additionally, during his talking alone time he used mainly his L1, but there were many cases during which he used English terms to refer to steps or actions he had to take and to resources offered during the gameplay. These terms came to his mind naturally, as if it was easier for him to recall them in English than in Greek. At some point he came across the word "epic" which was followed by an image of a very rare, as he said, and important weapon. The participant related the word to the visual and did not

search for more information in order to confirm or reject his initial thought. He didn't even realize that the word "epic" is a cognate so as to make the connection of the word's meaning between the two languages. A little later, he encountered the word "tile" which once more was accompanied by a visual, which assisted him to directly associate it with the word's meaning. On the next level of the game, one of the instructions said "Remain in the spotlight". The participant didn't understand the meaning of the word "spotlight" despite it being in context and there was no visual or sound that might have helped him to derive meaning. So, he experimented three times with the same instruction before he was able to understand the meaning of the word. During the observation the participant did not use any other resources, apart from the ones offered by the game to derive meaning. What I sensed was that looking unknown words up in a dictionary for example was thought as unnecessary and boring since no "serious" consequences were suffered in case of failure. As far as recalling the meaning of the new words is concerned what I observed was that when an unknown word was represented by an image only one encounter was enough for the participant to remember its meaning. The majority of these words represented tools and materials important for his game character and as such important elements of the gameplay. However, when new vocabulary was introduced in a context, for example instructions and directions, the participant had to come across the same instruction twice before he was able to fully recall their meaning. This happened because visuals were more frequently presented and they referred to something very specific, whereas the instructions were a bit more complicated to understand and they did not appear with the same frequency. As far as the retrieval of new words within context is concerned, the participant was able to produce them talking to himself while organizing the actions he wanted to take in order to win the game. Some of them were produced using English terms while others their Greek equivalents. The vocabulary, though, which referred to the resources he had available, was used in English.

Fourth Observation

When I entered the participant's house I found him sitting comfortably in his bedroom and getting ready to start playing the same MMOG he played during the first and the second observation. This time he had arranged with four friends of his to play online. So, they formed a team of five against other teams or solo players. The language used in the game environment was exclusively English. The participant and his co-players used a mixture of

Greek and English. More specifically they communicated in their L1 to comment on each other's performance during the game and in English when they referred to game resources, actions and steps they wanted to take. During this communication they used a microphone and speakers in order to talk to each other. As far as new vocabulary is concerned, unknown words related to the actual gameplay were not ignored. However, new vocabulary that did not affect the gameplay, like words about character's physical appearance or names, was sometimes ignored. While playing, the participant came across the word "split" mentioned by one of his co-players to another co-player. Initially, he didn't know the meaning of the word, so he started observing their actions. When he saw that the one, who had two weapons of the same kind, shared one with the other member of the team, he thought that "split" and "share" are synonyms. He didn't bother, though, to look for further information so as to ascertain his original guess. The participant did not use any resources outside the game to derive meaning. On the contrary, he relied heavily on visuals, context and his teammates' assistance whenever he faced difficulties with vocabulary. He trusted the members of his team for two main reasons. The first reason was that they knew the meaning of the unknown words and provided the participant with the Greek equivalent directly "... You are supposed to have a proficiency certificate". The second reason was that they have played the specific game level before and experimented trying different actions, so they have managed to derive meaning that they were willing to share with their co-players. As a result, the participant didn't feel the need to experiment with unknown words during the gameplay, because their meaning was either derived by visuals, context or his co-players. Unknown words which were accompanied by a visual or whose meaning was offered by co-players in their L1 seemed to be easier to recall after a single encounter. Unknown words found in instructions or directions (context) were more effectively recalled after two or three encounters. What was observed was that the time between deriving meaning and recalling of the same word, when it came to visuals, was in some cases either immediate or shorter than the time between deriving meaning and recalling when it came to context. In the latter case, the same or a similar instruction containing the same unknown word might be encountered again five or ten minutes after the initial encounter. In the case of a similar instruction, things seemed to be even harder as the participant had a completely new context to process so as to derive the meaning of the unknown word and that was the reason why the participant needed three encounters on average to be able to recall and retrieve them. As far as the retrieval and production of the

new vocabulary is concerned, the participant used the English terms while negotiating with his friends about the necessary steps and tactics they should apply to win the game and about the available resources he had and could share with them. These English terms were not only words the participant managed to understand and recall during this observation, but also words he had come across during earlier observations. While for most of their talking the team members used their L1, they used English to refer to specific items and actions. They also tried to adapt new vocabulary they acquired to their L1. An example they used was with the word "loot", which was used as "λουτάρω". They were not only able to recall the word's meaning, but also to "invent" a new way of producing it by adapting it to their L1.

Author's Statement:

I hereby expressly declare that, according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work, does not infringe any intellectual property, personality and personal data rights of third parties, does not contain works/contributions from third parties for which the permission of the authors/beneficiaries is required, is not the product of partial or total plagiarism, and that the sources used are limited to the literature references alone and meet the rules of scientific citations.