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« Language and Communication »

Investigating the role of video games in shaping EFL learners' critical thinking

Case Study: License and Master Students of English at Abdelhamid Ibn Badis University, Mostaganem

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Abstract

The recent years of the 21st century have been marked by an escalation of highly advanced entertainment platforms thanks to an ever-going development of new online and offline technologies. In particular, the life of millions of young people around the world would not be the same without video games, considering the fact that video games are becoming, or already are a mainstream phenomenon. Unfortunately, most researchers have only focused on the negative impact of playing video games. However, in our research work, we focus on the positive impact instead, and our primary objective is to investigate the role of video games in shaping EFL learners' critical thinking. Additionally, we will identify several positive aspects of video games to understand the developmental process of the individual's critical thinking and which type of video games is the most advantageous to attain convenient results. To carry out this research project, a questionnaire, an interview and an in-game observation were used as instruments to collect data. The results revealed that multiple types of video games could indeed enhance EFL learners' critical thinking. Furthermore, we would provide potential procedures to follow in order to reach the most beneficial results possible.

Key words: Video Games, Critical Thinking, EFL learners, Brain skills, Digital technology

Dedication

To my parents

Acknowledgement

The first person that I would like to express my gratitude to, is my supervisor; Dr. Dallel SARNOU for her guidance, advice, and help.

I would also like to thank my teachers of MASTER (Language and Communication) and first year LMD students of the department of English for their help and cooperation.

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General Introduction

This is the age of digital technology, and the use of digital devicesis essential to have an optimal life, and more importantly, Digital technology has transformed how people communicate, learn, and work. Today, Digital learning is any type of learning that uses technology; and video gaming is considered as one of the most advantageous digital tool to develop many brain competences.

It has often been argued that video games developers are masters of engagement; their aim is to attract people of all ages into the virtual world. Additionally, they create a digital environment to have people work towards a meaningful goal as they unconsciously develop multiple mind skills while having fun at the same time. It has become quite significant to understand the resulting data of playing video games, and to reconsider common misconceptions about video games as it is likely to find video gamers who can be healthy, socially active and college-educated, . Moreover, video games provide to people of all ages and different gender an interesting amount of entertainment and amusement.

Today, video gaming is a highly popular entertainment platform, and it is no longer limited to children and adolescents only, but also to people of all ages. The reason behind this sudden increase in popularity is due to the recently developed digital technologies, such as smart-phones, tablets and many other high-tech devices; the latter are exposing video games to their users by advertising them on social media and websites. Consequently, the number of people who spend many hours on a daily basis playing video games is consistently increasing.

For all the reasons mentioned above, video games have become of high interest for many researchers in various fields. However, many educational researchers have so far investigated mostly the negative impact of playing video games, and this is understandable if we consider the addiction, violence, and depression observed in the majority of individuals who play video games extensively.

In this research work, we do not focus on the communicational or motivation competences which individuals may obtain from playing video games; instead, our primary objective is to investigate and then identify how video games can develop the critical thinking of an EFL

learner. Another objective is to find out which type of video games is the most convenient to attain positive results regarding the EFL learner's critical thinking. Furthermore, we would investigate if video games have an impact on the EFL learners' educational and learning environment, and is it a positive or a negative impact.

To investigate the role of video games in enhancing the EFL learners' critical thinking, it is necessary to ask the following questions:

- What are the most played video games among the EFL learners?
- Is critical thinking a brain skill that can be developed through playing video games?
- How people should play video games to improve their critical thinking?

Our research work is related to the use of video games among the learners at the University of Abdelhamid Ibn Badis; with the aim of providing our readers with a maximum amount of data regarding the positive effects of video games on EFL learners. For this reason, the researcher set several answers to reach by the end of our research project. They are cited as follows:

- Video games play a role in enhancing the EFL learners' critical thinking.
- Strategy video games are the most convenient type of video games to enhance EFL learners' critical thinking.
- There are no different results between males and females playing video games.

According to the questions above, we predict three hypotheses:

1. EFL learners could be wasting their time and energy in playing certain types video games that do not improve brain skills but other competences such as fine motor skills, reflexes and few other skills that an EFL learner does not need in his educational and learning environment.
2. The positive effects of playing video games do not only enhance the person's critical thinking, but might develop other brain skills.
3. Playing video games might help EFL learners in their educational and learning environment.

In this regard, our research project is divided into three chapters. The first chapter sheds the light on the theoretical background and definitions regarding video games and critical thinking. The second chapter deals with the research methodology, data collection and the

description of the tools that are used in order to obtain the results. Additionally mention we would where we intend to use a research instrument in order to reach the objectives of the proposed study. Finally, the third chapter deals with the results that we would come out with and we would discuss the findings from the analysis of our collected data. It would also conclude with some suggestions and recommendation of how to properly use video games in the benefit of EFL learners.

CHAPTER ONE: Theoretical Background

1. Introduction

This chapter offers a brief theoretical background of our topic; it is divided into two parts. Mainly, the first part presents a brief historical background and multiple benefits of video games. The second part of this chapter includes definitions and standards of critical thinking. We will also deal with EFL learners' ability to develop critical thinking using video games as a tool and provide our readers with many scholars and specialists opinions regarding our research topic. Finally, we end up by questioning if video games have the capacity to enhance EFL learners' critical thinking.

1.1 Brief Overview on Video Games

In 1952, the first video game was introduced to the world. It was invented by A.S Douglas who was a student at the University of Cambridge. In this first video game, only one user only could play against a machine which used several programed calculations to win whenever possible. Later in 1972, Magnavox Company presented the Magnafox Odyssey game console which is known as the first video game console in the history. In modern times, video games' popularity has significantly increased among people, since they have become quite common and almost inevitable to have at least one video game on one person's smart phone. The massive economic income and popularity are the reason why video games developers keep ameliorating their work for the purpose of having a better quality, visuals and more importantly, the flexibility and ability to develop the human brain. (History.com Editors. 2017)

1.2 Benefits of playing video games

It is quite frequent to hear complaints about video games and how harmful they can be; people seem to only focus on the negative side of video games while overlooking their

positive side. The benefits of video games can be indeed surprising; Video games can make people more active. While one may think that those who sit home all day playing their favorite sports game are lazy and physically inactive, different types of sports games that involve basketball, tennis, or skateboarding were the project design of several studios, and they showcased a whole-body level of interaction instead of using the controller only. This can also lead the players to practice those same skills outdoors.

Playing video games may also be way for people to distract themselves from pain by paying attention to something else. It does not matter if it is a physical or mental pain/discomfort; focusing on the gameplay produces an analgesic (pain-killing) in our body system, so the more captivating the game is, the better the feeling of the player gets. Jane McGonigal (2010) says reality is broken and can only be fixed if we make the real world work like massive, multiplayer games.

In Japan, old people are advised to play any brain video game (problem-solving, memory, and puzzle video games) for at least one hour per day, because many Japanese researchers Ryuta Kawashima (2003), Akio Mori (2002) came to a conclusion that video games might slow down the aging process. In-fact, the so-called “brain games” have been shown to have a positive benefit on older players.

C. Shawn Green, Aaron R. Seitz (Sage journals Policy Insights from the Behavioral and Brain Sciences. 2015) mention a scientific study from the Behavioral and Brain Sciences Journal which shows that action games have a role in improving brain function than these so-called “brain games”, it is because these games have demands for quick decision-making, quick acknowledgment and interpretation of large amounts of information, and therefore they demand a high level of attention. Video games by their nature involve predominantly active forms of learning which is typically more effective than passive learning.

Researchers at Columbia University, Katherine M. Keyes, Andrew Rundle, Anne Paxton (2016) found that playing video games may be good for children, and having moderate gameplay for an hour or two would lead to a higher intellectual function as well as competence at school. Moreover, they believe that if children continue on that same pace of playing video games; this would not have any kind of negative impact on their activity in class.

Isabela Granic, Rutger CME Engels, Adam Lobel (2013) published a psychological study in The British Medical Journal also known as BMJ. The study presented a video game called

‘Sparks’ which is intended to help treat depression; the study found that ‘Sparks’ was better at treating depression than a lot of counselors. Ultimately it allowed kids and teens to be much more willing to be open about what they were feeling without being judged.

Prof Dr Boris Suchan, Sabrina Schenk and Robert Lech (2017) report their findings in the journal *Behavioural Brain Research about a group of* gamers that had to do a weather prediction task in a scientific study that was attempting to find out how video game players learn. The study was part of the collaborative research center which was funded by the German Research Foundation ‘Ruhr- Universität Bochum’, and it revealed that video gamers did better with high uncertain

ty and did good job generating new knowledge in comparison to people who do not play video games particularly action video games.

R Andy McKinley, Lindsey K McIntire and Margaret A Funke (2017) wrote about an experimental study that was done on unmanned aerial systems UAS (drones) to see who is able to handle the drones better, whether it would be professional pilots or people who play video games. The final scores were equal, but that is the point of the study. It could be considered as a proof that video games players and professional pilots are of equal competency when it comes to piloting drones. In this experiment, researchers have shown that there is no difference between a non-trained young adult who plays flying video games and a person who is trained and certified and has a job as a drone pilot.

Michael A. Rupp Richard Sweetman, Alejandra E Sosa (2017) investigated the effects of various different types of cognitive performance including relaxation and the effect that casual video games have on stress. Apparently, video games are effective in distressing the

brain. Playing a casual video game even briefly can restore individuals' affective abilities, making it a suitable activity to restore mood in response to stress. However, future research is needed to find activities capable of cognitive restoration.

The University of York (Multiplayer video games: Researchers discover link between skill and intelligence. 2017) discovered a link between people's ability to perform well in multiplayers video games to a higher level of intelligence and to improve the person's communicational skills. The focus on these games were MOBAs (Multiplayer Online Battle Arena) and FPS (feet per second) and it was found out that both of these types of video games are simply not intellectually demanding which means that it is not important whether the individual has a wide intercultural background or not in order to play this type of video games.

1.3 Global Importance of Video Games

Video games are often portrayed as a time wasting activity by a lot of people and especially parents. The debate of whether they are a necessity in a child's growth or just a harmful hobby. Having said that, it is quite important to play video games at least 30mn a day. Greg L. West, Konishi K, Benady-Chorney J, Bohbot VD, Peretz (2017) mentioned a scientific study that shows an increase in cognitive functions after having participants play super Mario 64 for 30mn a day over 2 months. Afterwards, the brain of these participants had had increase of grey matter in areas related to memory, strategic planning, and fine motor skills of the hands compared to those who had not played.
Video games can also be incredibly educational; there is even a list of educational video games created by WatchMojo.com on which is a youtube channel that suggests these following video games: Brain Age, Carmen Sandiego, and The Oregon Trail. These video games are used as effective teaching tools for both children and adults.

Raffaello Urbani from the Youtube channel "Metatron" who teaches language learning and speaks multiple languages such as English, Italian, Japanese, and Chinese, strongly supports in his Youtube videos the idea of learning foreign languages through playing video games. He adds that it is a much viable, easier, fun and even more effective than traditional book

learning. However, in order to make it effective, there is a certain pattern that the individual must follow to reach the most advantageous outcome. One of these methods is to describe what can be seen on the screen while playing.

A scientific report (The National Eye Institute and the Office of Naval Research. 2009) affirms that video games players have better eyesight than non-gamers which is important as it is one of the first things to diminish with age. If any individual who does not play video games and starts doing so, this individual will see improvements in eyesight within a significant period of time. Daphne Bavelier (2009) a professor of brain and cognitive sciences at the University of Rochester, said in a statement: that they have found action video games to be a good exercise to train the brain to process the existing visual information more efficiently, and the improvements lasted for months after game play stopped.

A BBC article (Video games help reading in children with dyslexia, 2013) refers to a study of 10-year-old children who played 12 hours of an "action" video game found that it improved their reading speed without any cost to accuracy. Video games may even improve children's reading skills, but more research was needed in order to confirm the theory. The team from Simone Gori, Andrea Facoetti, Sandro Franceschini (The University of Padua. 2013) reported that they have found out video games players have better attention skills, and they are able to read faster without losing any accuracy. Today, therapists request their patients who are suffering from dyslexia to play video games as a treatment. (Research Italy. Action video games against dyslexia. 2017).

1.4 Critical Thinking

1.4.1 An Introduction to Critical Thinking

Critical thinking is the process of analyzing and evaluating information to reach the most rational and logical answer or conclusion as it is one of the most effective problem-solving. Richard W. Paul (2001) claims that Critical thinking is divided into two categories. The first one is referred to as 'critical analysis' in which the critical thinker tries to find evidence in order to accept the information. The second category is the one where the critical thinker makes clear and reasoned judgments. Critical thinkers are usually open-minded and do not take anything for granted as they demand reasoning when receiving information. All thinking, whether it is about what to believe, what to value, or what to do is interpreted

differently depending on the individual's critical thinking. Paul also refers to critical thinking as "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating, reasoning… as a guide to belief and action. (Critical Thinking: Tools for Taking Charge of Your Learning and Your Life. P371)

Critical thinking should not be misinterpreted with being argumentative or being critical of other people although critical thinking skills can often be used in exposing fallacies and bad reasoning. People who use critical thinking usually ask for evidence that involves supporting a particular argument or conclusion, and they are the ones who say things such as, 'How do you know that?' or 'can you prove it?'. Also, there are three features that make people critical thinkers:

A- Curiosity: it refers to the eagerness to learn more information and seek evidence also the fact of being open to new ideas.
B- Skepticism: it refers to the idea of being open to new ideas while having doubts about the truth or value of a given thought or belief and not blindly believing in everything everyone says.
C- Humility: it is the ability to admit that one's opinions and ideas are wrong when faced with new convincing evidence that states otherwise.

Critical thinking is not a matter of having too much information; A person with a good memory or who knows a lot of facts is not necessarily a good critical thinker. However, a critical thinker is able to resolve consequences from what s/he knows and s/he can make use of particular information to solve problems. Critical thinking can help people acquire knowledge, improve their thinking, enhance their arguments and develop reasoning skills.

1.4.2 Critical Thinking Standards

People have a certain ability to break down new ideas, thoughts or information; that ability consists of analyzing the world around us and trying to find the truth to make perfect sense of the world.

Unfortunately, human beings are ego-centric and socio-centric since they rather prioritize their own desires over what is good for us. So, in order to make the right decisions people

need to force themselves to look at things the way they truly are. So, to evaluate the quality of their thinking, they use the critical thinking standards.

There are nine Intellectual Standards we use to assess thinking: **Clarity**, **Accuracy**, **Precision**, **Relevance**, **Depth**, **Breadth**, **Logic**, **Significance**, and **Fairness**.

Clarity: Clarity of thought is the most important standard of critical thinking; it is about what we believe and why we believe it. “If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we don’t know what it is saying.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P92-93)

Precision: it is associated with the hard work that the individual produce when dealing with an issue, and here are certain questions that the person can ask in order to reach answers: What is the problem at issue? What are the possible answers? What are the strengths and weaknesses of each answer? “To be precise is to give details necessary for someone to understand exactly what is meant. Some situations don’t call for detail.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P94-95)

Accuracy: is without a doubt very essential to critical thinking, a critical thinker would need facts and accurate information so that he can proceed to analyze the situation. “To be accurate is to represent something in accordance with the way it actually is. People often present or describe things or events in a way that is not in accordance with the way things actually are.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P93-94)

Relevance: means that the ideas and information discussed must be lined to the issue being discussed. Politicians for example are great at distracting us away from the issue. “Something is relevant when it is directly connected with and bears upon the issue at hand.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P95-96)

Depth: It is about thinking below the surface of the issue and to deal with problems with a more responsible manner, especially if the arguments provided contain certain complexities that are necessary to prove a point. “Our thinking will work better for us when we recognize complicated questions and address each area of complexity in the question.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. 97-98)

Breadth: It is to take into consideration additional aspects of the situation that is being discussed, and if all sides of an argument are discussed**.** “One of the primary mechanisms the mind uses to avoid giving up what it wants is to refuse to consider viewpoints that differ from its own” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P9)

Logic: and it means that the arguments given must be reasonable, if the information makes sense? Then it is logical. “Thinking brings together a variety of thoughts in some order. When the combined thought is mutually supporting and makes sense in combination, thinking is logical.” (Paul and Elder, Critical Thinking: Concepts and Tools, 9.)

Significance: including the most important ideas is important to make a solid argument, essential facts are crucial to make a point. “When we reason through issues, we want to concentrate on the most important (relevant) information and take into consideration the most important concepts.” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P9)

Fairness: the argument must be balanced and cleared from all side feelings, when an argument is objective, there is Fairness. “When we think through a problem, we want to make sure our thinking is justified? To be justified is to think fairly in context and in accord with reason. ” Richard Paul, Linda Elder (2012) Critical Thinking: Tools for Taking Charge of Your Learning and Your Life (3rd ed. P9)

1.4.3 Benefits of Critical Thinking

Curiosity is one of the benefits of critical thinking because it gives the person a deeper understanding about what matters in his/her personal environment and this extends to what students learn in school and also the topics that people find relevant in their daily lives. Effective critical thinkers have a lot of interests and are curious about a wide range of topics; they also show understanding of and appreciation for the beliefs, cultures, and views that are a shared quality of our humanity. This feature does not only make them critical thinkers, but also long-life learners. Critical thinkers are curious by nature, and they are consistently improving their critical thinking skills because they have opportunities all around them every moment.

Creativity is unquestionably a skill developed throughout critical thinking and it is ranked second after the problem solving skill in terms of efficiency, there's no question that effective critical thinkers are also largely creative thinkers. Critical thinkers tend to be more creative than non-critical thinkers.

Today, different fields like business, marketing, and professional alliances rely heavily on one's ability to be creative, as a matter of fact, companies and modern workforces know an increase in their global marketplace when they get creative in their products or the way they advertise them. According to Norio Ohga (2006) former Sony Chairman and inventor of the CD; at Sony, they assume that all products of their competitors have basically the same technology, price, performance and features. Design is the only thing that differentiates one product from another in the marketplace.

Creative people question different suppositions instead of arguing about limitations. Creativity is eternal and it has endless potential, which means if we are creative, we are also limitless to what we can achieve and this refers to learners of all age.

Those who think critically tend to be natural problem-solvers, they instinctively solve problems. Most critical thinkers spend more time to solve a problem than a regular person, a critical thinker would likely spend 5 minutes on the solution and the other 55 minutes defining and researching the problem. Furthermore, it is also worth noting that patience and commitment to truly understand a problem is a sign of being a true critical thinker, and it is the main reason why critical thinking is essential to being an effective problem-solver. Critical thinking capacity gives people the tenacity to solve complicated and unsolved questions and more.

Critical thinking is known for enveloping a wide array of skills such as: reasoning skills, evaluative skills, organizational and planning skills, observational skills, open-mindedness, creative visualization techniques, questioning ability, questioning ability among many other skills, and this list can be expanded to include other skills but this is just to give one and idea of what is being unconsciously developed when we choose to think critically in our daily lives. One could say that it is a multifaceted practice to the mind, and the mind has to be exercised just like a muscle to stay healthy.

Critical thinking also fosters independence, and gets learners to start thinking independently, and this is one of the many goals of education. When students think for themselves, they learn to become independent.

From another perspective, critical thinking is a skill for life. It is a skill to use every day, where the EFL learner can use it as a tool to be successful in the classroom and also in life when the educational, formative years are done. Many great educators talked about the importance of lifelong learning skills such as critical thinking, leadership, adaptability.

Educators want their learners to succeed in and out of the classroom. The idea is to make sure that once they are out facing the world, they would perform at their best and to use what they have learned, developed in the classroom to shape their future. Fundamentally, they *never stop being learners.* This is what it means to be a lifelong learner and a critical thinker.

1.5 Conclusion

This chapter dealt with the theoretical background and definitions regarding video games and critical thinking. Furthermore, it has shed the light on the benefits of both video games and critical thinking, and what is their impact on EFL learners' educational life. Additionally, this chapter highlighted several types of studies such as scientific, psychological and few other studies. We also mentioned some scholars and specialists opinions regarding our research topic. Now, we will proceed with chapter two, which is the practical part of this research project.

CHAPTER 2

CHAPTER TWO : Research Methodology

2. Introduction

The previous chapter focused on presenting various theoretical aspects of video games and critical thinking. In this chapter, we will deal with the research methodology and data collection. We will explain the role of video games in developing EFL students' critical thinking by analyzing the data collected from the questionnaires and interviews targeting License and Master Students of English At Abdelhamid Ibn Badis University, Mostaganem. The other purpose of this chapter is to examine if video games are used as a constructive tool to improve the students' critical thinking. We would also investigate if video games can be used in learning environments/fields or as tasks to be done at home to direct EFL students toward a meaningful goal. Finally, this chapter will describe the questionnaire, interviews and their advantages.

2.1 Research Methodology

This study aims at investigating the attitudes of License and master English students towards playing video games and using video gaming as a tool to develop brain skills. Also, it analyzes students' points of view towards the use of video games in enhancing their critical thinking. From this understanding, the following research questions were developed in order to select purposeful data collection instruments that would give answers to:

- What is the most played genre of video games among EFL learners that can improve the individual's critical thinking?
- What are the most effective methods of playing a video game that can improve the EFL learners' critical thinking?
- Does the gamer consciously notice the improvement since the integration of the video games routine and is it addictive?

2.2 Data Collection

Data collection is the process of gathering information on specific variables using one or various instruments with the aim of evaluating a research work. Therefore, in this study, questionnaires, multiple interviews and an in-game observation were opted for as instruments to confirm or reject the hypothesis that we put forward earlier which claims that video games can shape EFL learners' critical thinking.

2.3 Research Instruments

The questionnaire was submitted online. The reason behind designing an online questionnaire is to give first year English students the time necessary to submit their responses.

As for the interviews, we consulted several methods from The Peak Performance Center to find out the methods used in order to confirm if a person is a critical thinker or not, and then to examine the participants' attitude, evaluating information and weighing opinions. The interviews took place at the English Department at University of Abdelhamid Ibn Badis,

Data was also collected using the in-game observation in which the researcher integrates the video game with his participants and simultaneously analyses their behaviors, attitude and mindset. To accomplish the in-game observation, paper notes with the name of the researcher's discord[1] (Leonath) were distributed among License and Master students of English at Abdelhamid Ibn Badis University in Mostaganem, in order to join our discord and to be selected for our study. Then, we created a group in an online multiplayer video game called League of Legends[2] and submitted the link of the group in our discord so that interested can enter the video game to join us.

[1] Is a free *application* and digital distribution platform designed for video gaming communities
[2] Is a competitive multiplayer online game that is free to play, mostly based on decision making

2.4 The Choice of the Participants

- How good students can use their fine motor skills because we estimate that this shows how long they have been playing video games
- The amount of time they spend in playing video games during a week.
- If the participants of our study are aware of our research purpose (those who knew the purpose were rated higher than those who did not know)

2.5 The Questionnaire

A questionnaire is an essential and a basic data collection instrument. Our research questionnaire focused on evaluating the participants' point of view towards the benefits of playing video games. The participants begin by answering the first three questions that let us have a brief information about the participant's personal information, such as age and gender. As for the second part which serves as the questionnaire's backbone, it is dedicated to the investigation of the impact that online video games have on the learners' critical thinking. The second part is composed of questions with several choices of answers. Accordingly, the questionnaire ends with the feedback section, in which significant information about the choice of the video games that supposedly improve the participants' critical thinking and some other important data were giving in the final part of the questionnaire.

The questionnaire consists of multiple types of questions in which the participant can provide further details for data collection purposes. We also provided large extra space for the participants to freely express their opinions which would grant us quantitative data regarding our hypothesis.

The participants start by answering the first part of the questionnaire which provided us with the participant's personal information; the reason behind having personal information about the participants is to divide them into groups and find out the possible differences in improvements related to gender and age while analyzing the data.

In the second part of the questionnaire, the participants start answering the first two questions for the purpose of knowing what type of video games the participant plays

frequently, provided with a wide range of choices such as action games, strategy games, simulation and several other types of video games. These two questions will give us a lead to whether the participant has developed a critical thinking or not. There are some great games for building critical-reasoning skills. Those skills help kids become good decision makers and problem solvers. In this perspective, we recommended two types of video games that can enhance the individual's critical thinking which are simulation video games and most of multiplayer video games that we used as an environment for our data collecting. The third and fourth questions' aim is to know at what extent learners are familiar with video games or in some cases online video games like the one we used in our in-game observation; this would provide the researcher with the information that the participant has about critical thinking. The fifth and sixth questions would provide the researcher with the rationale behind integrating video games and if it has become addictive since then. The purpose of the remaining questions is to identify at what extent participants believe that video games have affected their problem-solving skills, reasoning, evaluating information and weighing opinions.

The last part of the questionnaire has the aim of collecting additional data concerning the participants' choice of video games and to what extent video games affected their English modules grades. In the third part of the questionnaire, the participants also have the opportunity to express freely their opinions and views about video games' impact on the different mind skills; the rationale behind this question is the find out to what degree the players perceive the potential of video games in improving their critical thinking's characteristics when interacting with people while playing.

2.6 The Interview

We used the interview as a second data collection instrument in order to achieve the results intended for our study. The aim of using interviews is not only to gather a mixture of data from gamers, but also to analyze and link the interviews' results with the data collected from the questionnaire.

The interviews were conducted with License and Master students of English at the university of Abdelhamid Ibn Badis. The interviews consists of a set of questions in which it starts with questions that can be answered only in a specific way, such as true, or false; yes, no, or don't know; not good, good, fair, or very good, etc. In another part of the interview, the researcher

gives the chance to the interviewees to express their opinion which encourages them to give more useful information, such as their opinions toward sensitive issues. This type of questions is the reason behind choosing the interview as our second data collection instrument, because the second set of questions allows the interviewees to communicate and express their flow of thoughts and provide details about their gaming experience.

2.6.1 The Choice of The Interviewees

The researcher's choice of participants who would be interviewed was based on how good they can use their fine motor skills, relevance in their decision making, precision and clarity in the League of Legends online video game. A survey checklist was also given to the interviewees.

2.6.1.1 The Survey Checklist

A survey checklist was given to the interviewees before taking the interview. The title of the survey checklist is **"**Gamers' point of view towards Characteristics of critical thinking in video games". Never, Usually, Always, About half of the time, are the boxes for the interviewees to check, and these are the following suggestions:

1- I play video games to develop my critical thinking
2- I encourage people to play video games
3- I facilitate and monitor appropriate interactions while playing video games
4- I am becoming a better person by playing video games
5- I am more flexible in dealing with situations that require decision making after playing video games for a long period of time
6- Critical thinking and problem solving are frequent skills among gamers
7- I use strategies to encourage active learning when playing video games

2.6.2 The Interview's Questions

In the first part of the interview, question (1) How many types of video games do you play on the regular basis?

Question (2) Are you aware of the critical thinking competence?

As for the second part of the interview

Question (3) What is the amount of time that you spend in playing video games and is it different during the period of school?

Question (5) Do you use video games as a tool to enhance your critical thinking? If yes, say why

Question (6) According to you which of the following critical thinking skills EFL learners need to develop the most?

- Problem-solving
- Use of logic
- Questioning an information/idea
- Reasoning

Question (7) What are the difficulties that you face in playing a strategic/ decision making video game?

2.6.3 The In-Game Observation

The in-game observation is considered to be the most important instrument in our research, because it would provide the researcher with data collected from the participants' daily experiences. It is the most relevant choice among our two other instruments due to its nature of being a human behavior study.

The aim behind the use of the in game observation is to gather data while taking into account different aspects of the critical thinking basic skills such as the game perception, game knowledge, map awareness, and champions' pick before moving to the observation. The researcher cannot conduct a good observation on participants' critical thinking's standards if they do not know the basics of the video game. One other aspect of this observation is to identify the participants' behavior and state of mind while conducting a game with the researcher; any signs of timidity, shyness, stress are going to negatively affect the actions of the participants during the game.

There is a another objective that is also related to the aim of our study, and it is to observe the participants' thinking during the game and to what extent the participants use their critical thinking to try to win the game knowing that the critical thinking skills are the key to win a League of Legends game. 12 students showed positive signs of comfort during the game, and

knowledge of the game. Because it is important to know how the games works, or else, we cannot conduct our research on these participants.
Several conditions had to be taken into consideration for both the researcher and the participants in order to assume having credibility in the collected data. The more comfortable the participant is with the researcher, the more reliable his in-game skills are.

We had to choose an appropriate video game for our participants, because they do not share the same interest in the different types of video games. So, we thought about providing a wide range of video games such as League of Legends, God Of War and Mortel Combat, World Of Warcraft, Naruto Online Bandai. The participants were more excited to play League of Legends. The reason behind asking the in-game participants which video games do they prefer the most is the fact that these participants will feel more relaxed.

2.6.4 The Video Game (League of Legends)

In the end, all the participants agreed to play League of Legends due to its popularity.

League of Legends is a free multiplayer online battle arena video game that has recently gained popularity among players from around the globe. In *League of Legends*, the player chooses and controls one of 148 'champions' in total; every champion has unique skills and it is the reason why 28 participants could not pass the fundamental observation test. The researcher chose *League of Legends* in particular due to the fact that the game is one of the biggest virtual platforms in the world becoming the largest online video game community in the world. Additionally, it is free, which means that every participant can join.
League of Legends is a team-based online video game; therefore, decision making is very important and wrong decisions often negatively affect the entire team. Furthermore, fine motor skills, clarity, precision, awareness and other critical thinking standards are important in order to win a game. The researcher chose this game also because it gives the possibility to re-watch the game and focus more on the participants' movements and thinking rather than the game itself.
Another reason why the researcher chose League of Legends to be the in-game observation tool is the fact that the game provides the rank of every participant and the higher the rank is the more advanced is the participant's critical thinking, which makes it quite easy to distinguish between high critical thinking users and those who still haven't yet developed the skill. Individuals with a high critical thinking are usually above silver, just as shown in the picture below:

The game also gives every detail of the match played, mentioning every player's strong and weak points, and every given statistic is related to one of the critical thinking's standards just as shown in the picture below:

The researcher has used various techniques to establish a reliable observation. We had to go through multiple steps before the observation, such as creating a calm environment in the chat and introducing the different players to each other. And the researcher will go through this procedure at the beginning of every observation session..

Fortunately, the participants of our study were speaking in English during the in-game observation. They were talkative and did not have issues with engaging in conversations with

one another; also, there were no signs of discomfort as the game proceeds. During the game, participants talked less by the order of the researcher to prevent the participants from losing concentration and to focus more on the game rather than chatting with each other, although they were allowed to use a special set of expressions and words from time to time because communication is fundamental to win a League of Legends match.

In the end of every game, the participants showed proof of clear and rational thinking, engaging in reflective and independent thinking. Furthermore, the participants identified, analyzed and solved problems systematically rather than by intuition or instinctively, and these are signs of critical thinking.

2.7 Conclusion

In the second chapter, we dealt with the methodology and the data collection materials that shaped our research. This chapter spots the light on numerous important points that can enhance the EFL learners' critical thinking. We also mentioned the procedures and details of the instruments that we used in our study, while giving precise description to each aspect of our data collection. Questionnaires, interviews, and an in-game observation were the instruments used in order to complete our data collection; the results obtained from data collection tools were all listed in this chapter. The data gathered from the License and Master students will be investigated and analyzed in the next chapter.

CHAPTER 3

CHAPTER THREE : Data Analysis and Results

3. Introduction

In this chapter, the data collected through the questionnaires, interviews and the in-game observation will be statistically examined. First it begins with the analysis of the assembled data from the three instruments in the following order : questionnaires, interviews, in-game observation. Second, we will use the evaluated statistics to determine whether we affirm or neglect the hypothesis of the video games playing part in enhancing the EFL learners' critical thinking. Other minor objectives will be discussed in this chapter, such as revealing which types of games develop the learners' critical thinking, unveiling effective methods to properly play a video game to improve certain skills, and finally highlighting the differences between EFL students who use video games as a method to enhance critical thinking and those who use other methods and which one is better.

3.1 Discussion

In this part, we intend to interpret the results of the data collected from the instruments displayed in chapter two and statistically evaluate them in order to have a better insight of the study. Displaying the collected data from chapter two into graph columns is necessary to have a visual proof to whether confirm or reject our hypothesis.

The analysis of the collected data aims to determine the following objectives:

1- Determine which type of video game is the most advantageous
2- Find out the role of video video games in shaping the individual's critical thinking, the answer to this analysis will be shown in graph columns

3- Conclude this research work with multiple results from each instrument to determine whether these results are worthy or not.

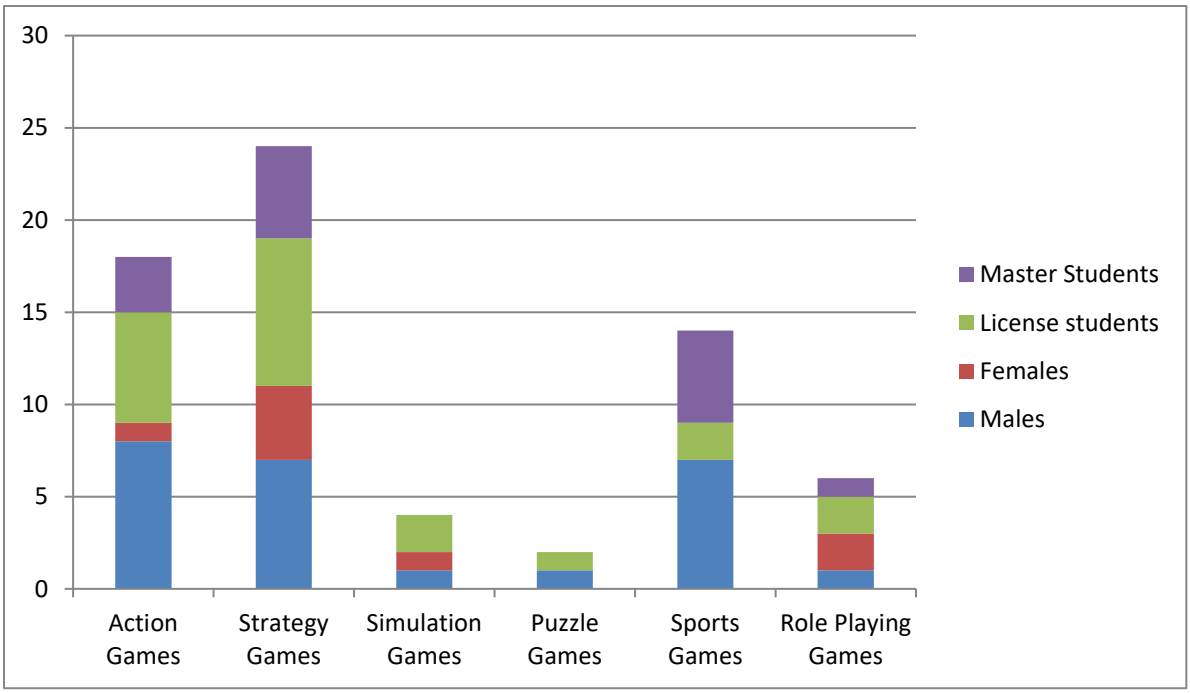
The researcher will analyze the instruments in this chapter in the following order Questionnaires, Interviews, In-game Observation alongside a survey check. Other minor references were taken into consideration such as age and gender. Our objective is to examine the collected data to understand the EFL learners' perceptions towards the use of online video games.

3.1.1 Analysis of the Questionnaire

As mentioned in chapter two, the questionnaire was used to find out whether online video games have positive effects upon the critical thinking according to the participants who took the questionnaire. We show the results of our investigation in graph columns with both males and females examination.

The following column graph shows a numerical analysis of the fourth question of the questionnaire in which gives us data regarding the type of video games that the participants play the most frequently

Figure 01: The Most Played Type of Video Games



The graph above showed that most males play action games. According to Melina Uncapher (2016) Action games show improvements in behavioral and neuroscientific evidence is revealing the positive benefits of action video gameplay for improving a wide range of abilities, from simple perceptual and motor skills to higher-level abilities such as cognitive flexibility, attentional control, and learning. Moreover, most females play strategy video games which are the type of video games that shape the individual's critical thinking. Strategy games improve teamwork and decision making skills**.** Tom Jager (2017) says that strategy video games often require players to make decisions similar to those done in business, such as resource allocation, spending, and using resources. This representative nature of the challenges allows improving these skills in real life.

The next graph shows a numerical analysis of the third question of the second part of the questionnaire in which the participants choose between these four mind skills: Critical thinking, creativity, memorization, processing speed, to let us know which one do video games improve the most

Figure 02: The Mind Skill That Video Games Improve

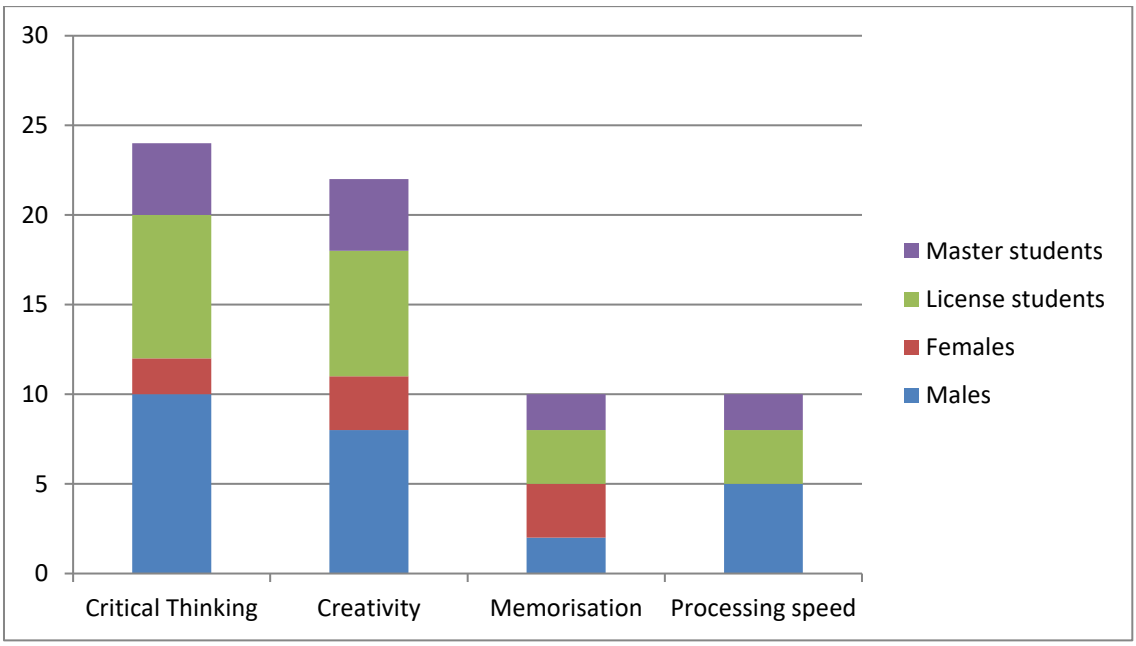
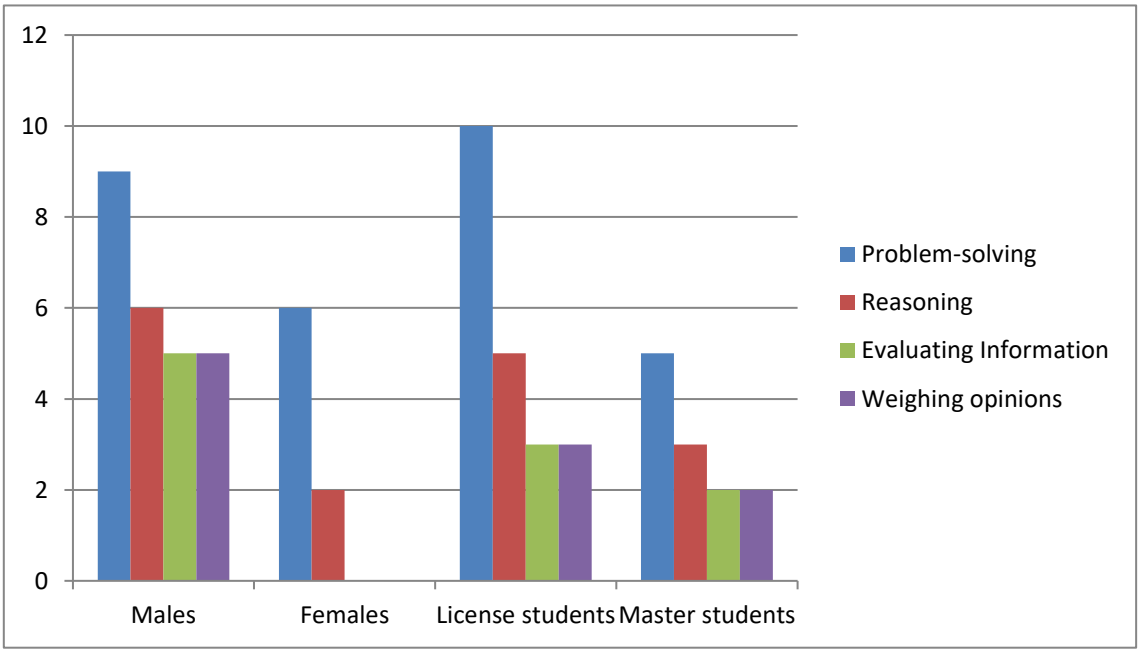


Figure 02 shows that most males believe that people who play video games are critical thinkers.

The last part of the questionnaire objective is to identify at what extent participants believe that video games have affected their problem-solving skills, reasoning, evaluating information and weighing opinions. We demonstrated this question in a different graph as shown down below

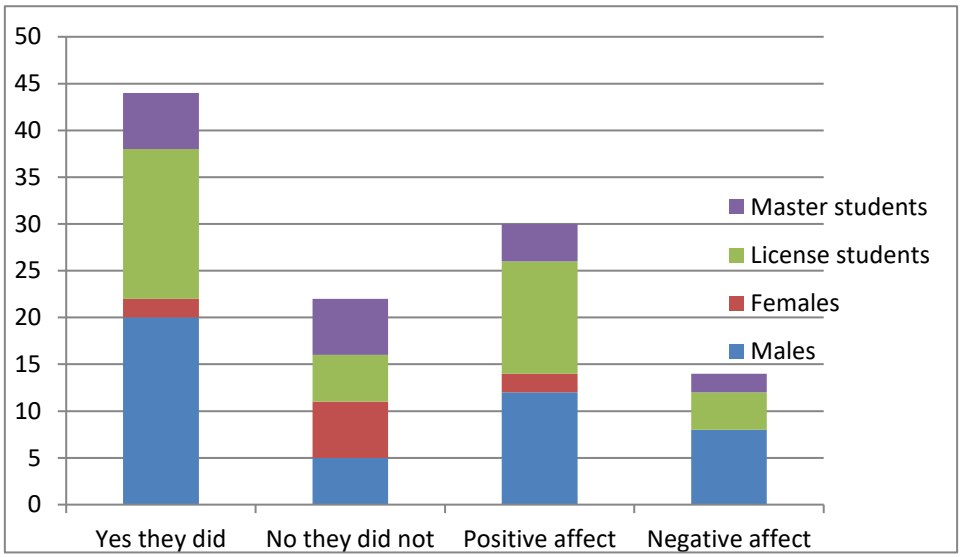
Figure 03: The Effect of Video Games on Problem-solving, Reasoning, Evaluating Information and Weighing opinions



From the graph above, we see similarities, as most males believe video games improve the problem solving skills, and so do females which was an expected outcome. “Adolescents reported playing strategic video games, such as role-playing games, the more they improved in problem solving and school grades the following year” Isabela Granic (The benefits of playing video games, p74)

The last part of the questionnaire aim is to know if video games affected the participants’ school/ University grades, if yes, than the participant have to report whether it affected him/her positively or negatively. The results are demonstrated in figure 04

Figure 04: The Effects of Video Games on Learners' Grades/ is it Positive or Negative



In figure 04, we notice that the majority of our questionnaire participants agree that video games affected their grades in school/ university, above the average of these participants claimed video games to have positive effects on their grades. Furthermore, all the affected females believe that the impact is positive.

In the last question, we asked participants about the possibility of video games improving their critical thinking competence, the results are shown in down below in figure 05

Figure 05: The Effect of Video Games on EFL Learners' Critical Thinking

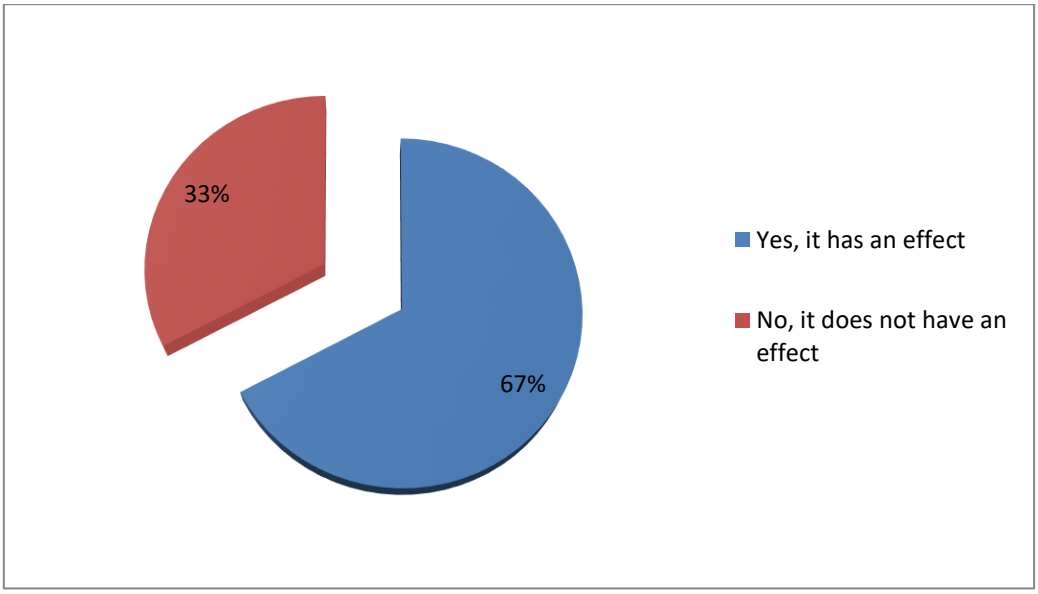


Figure 05 shows that the majority of the questionnaire's participants believe that video games affect the EFL learners' critical thinking. The researcher provided space to explain and give more insight about the participant's point of view in the last question question. Some participants who believe that video games affect EFL learners' critical thinking said:

- "By playing tower defence video games, I learned how to make quick decisions in different situations in real life, especially when I am arguing with someone. It also became easier for me to not accept any kind of information without proof"
- "The ability of video games to relieve stress which gives me times to think about my next move without overthinking things, this helped me in making the right decisions when I am cool-headed"
- "I learned from playing strategy video games to take my time before judging, because it is the same in both real life and strategy games, you need a lot of information before making a move, otherwise you would make mistakes and make the wrong decisions"
- "Reasoning is what I improved from playing video games, because in a video game you watch and listen more than you speak, and that's how I became in real life, so right now I am focusing more on what is happening around me or the situations im in"

Moreover, the rest 33% of the participants do not share the same opinion as the ones above, and the reason behind their statement is the type of video game they play, none of these participants play strategy, simulation, adventure video games. This participant said:

- "I don't believe that video games can improve critical thinking, because I've been playing Fifa (A sports "football" video game) for many years, and I didn't learn anything except improving my fine motor skills and to have more clarity (clairvoyance)"

The comment of the participant above makes a lot of sense due to the fact that he plays a sport video game. Although, he mentioned "clarity" which is the most important skill in the critical thinking competence, and it is always mentioned first whenever discussing the critical thinking skills set.

Another participant said:

- "I spend a minimum of time playing video games, I only play for fun and nothing else, so I am not sure if I can say yes to this, I believe that the virtual world is separated

from the real world, so I am pretty sure that whatever happens in the virtual world, stay in the virtual world"

The comment above lacks credibility because the participant occasionally plays video games. There is a minimum amount of time that the individual need to spend every day. Kevin Anderson (2019) is a graphic video games designer, he said in an article for Forbes that in average, gamers are playing for 7 hours and 7 minutes each week; which does not sound like a big number because he plays a lot more than that.

3.1.2 The Interview Analysis

Our research work is about a topic that cannot be dealt with using questionnaires only. The researcher felt the obligation to use an interview as a second data collection instrument; a direct contact and vivid live data will give a better insight and more depth to our research which is to study the human behavior response to video games and is it going to develop a critical thinking competence out of playing video games.

A participant's experience concerning the use of video games is important to us, and it requires a conversation between the interviewer and the interviewee to investigate certain situations that cannot be discussed in a questionnaire. Furthermore, the interviewer can explain his topic research to get accurate answers. The researcher used a voice memo to record the participant's testimony or comments about some direct questions and we will reveal them down below (We picked an answer from each interviewee to mention in this interview analysis)

- Question (1) When was the first time you started playing video games and how was your first experience?

Answer: "I was 8 years old, I played super Mario kart with my cousin on his PS1, it was amazing. The impact was so big that I can still feel the emotions I got back then"

- Question (2) Do you know what is critical thinking?

Answer: "Yeah, of course I do, it means making reasoned judgments that are logical and well-thought out, also the critical thinker doesn't take information for granted, he'd rather make sure it is true before he believes it"

- Question (3) Do you think that video games can improve your mind skills?

Answer: “For sure, Im a gamer myself and I notice a lot of changes. The way I think, the way I deal with different situations! Do you know that I actually memorized the topic of my baccalaureate test subject from playing Commandos 5. The other day I won 12 Air Hockey games and didn’t lose, not even once! I noticed that I have some crazy reaction skills, this is the fruit of my daily Fifa 20 Practice”

- Question (4) Which type of video game’s skill improvements is the most advantageous in real life?

Answer (1): “Deffinitly strategy games.”

Answer (2): “Strategy games, boy”

Answer (3): “Strategy games like Warcraft, League of Legends, Age of Empire and some others”

- Question (5) Why do you think that a strategy video game can help you live a better life?

Answer (1): “Its not the video game itself man, its what comes with it. You become better in making decisions because that’s what the game is all about, its true that you have high chances to lose a game but through practice you learn from your mistakes and you can do the same in real life”

Answer (2): “In a strategy game, you analyze the situation before making any move and it becomes a habit, and it goes on until it becomes part of your life”

- Question (6) Do you know that all the things you mentioned in the previous answer are all critical thinking skills?

Answer (1): “Haha, no, but I do now”

Answer (2): “Yeah I know, you can ask anybody who plays video games and he’d give you the same answer. I mean who would choose to have flexible fingers over making good life decisions?”

3.1.3 The In-Game Observation Analysis

As mentioned before, the type of video game used to conduct this observation is a strategy online game called League of Legends, we chose this video game due to its popularity among young adults, and also because most participants agreed to play this game over other strategy video games such as Age of Empire, Settlers, World of Warcraft.

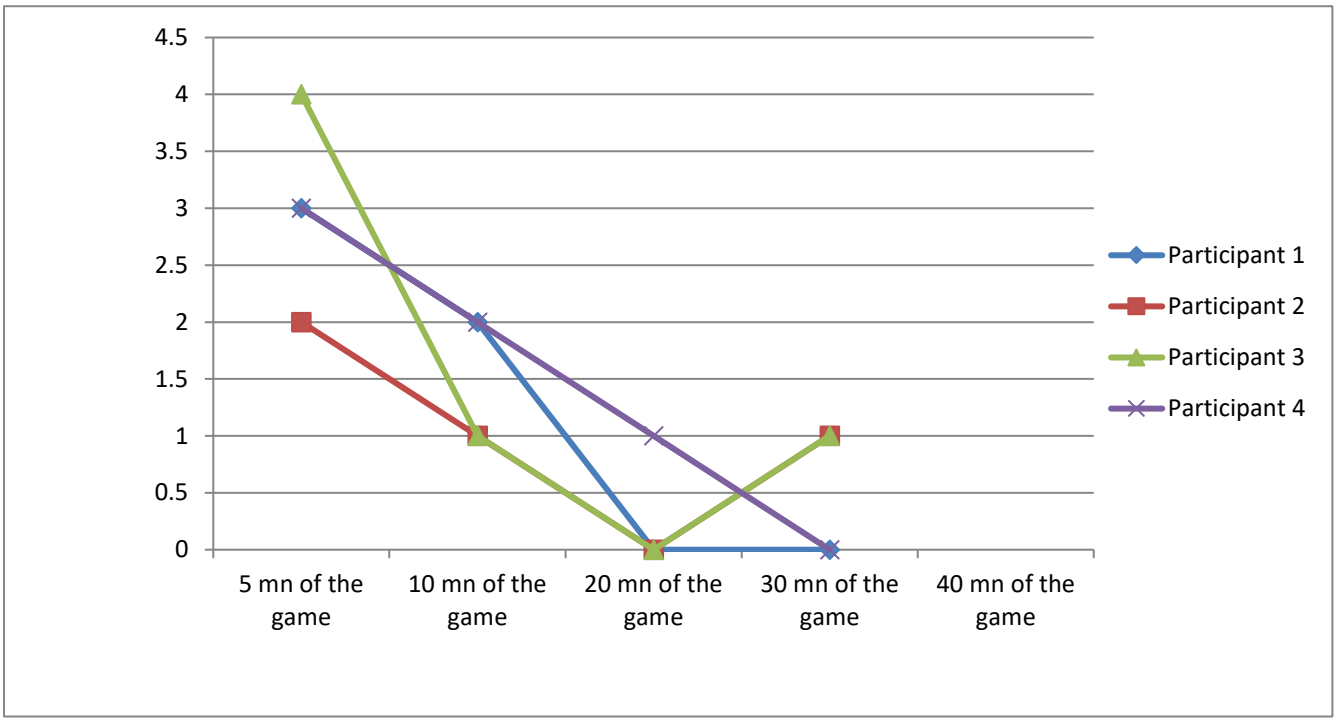
Regrettably, a video is required to give visual evidence or statistics of the participants' performances. Moreover, we will try to explain what we analyzed during the game and was the in-game observation as successful as the questionnaire and the interview.

The observation starts when the game begins, and it gradually intensifies as the game prolongs. What we try to observe during the game is the clarity, decision-making, reasoning and the logic that the participant uses before making a move.

Fortunately, we did not see any rush, precipitation or illogic moves during the game, because any sign of non-calculated player movements means that the participant is not a critical thinker like we thought, there were some mistakes during the early-game but it normal, a person cannot play a 30 minutes League of Legends game without miscalculating at least two or three situations.

The hardest part was the midd-game and late-game observation especially for the researcher. One wrong decision during late-game will definitely lead to the defeat. I will demonstrate a game down below in line graphs to describe what actually happened and how we evaluate their mistakes in graphs

Figure 06: Number Of Mistakes Made During The Game



3.1.3.1 Figure 06 Explanation

Before we get to the explanation, we would like to highlight that these are common mistakes and it is remarkable to play a 30/35 minutes League of Legends game with such a low mistakes rate. Each point refers to a certain mistake, such as, miscalculations, precipitations and other common fouls.

Participant (1): made 2 mistakes during the early-game, after that, he redeemed himself, the participant improved during the midd-game.

Participant (2): Finished the game remarkably, scoring the highest rated player among the other players with almost no miscalculations at all.

Participant (3): This participant is a female, stressed in the beginning of the game but with the help of the other participants, she regained her self-confidence.

Participant (4): The only participant with one mistake during each part of the game, which is above average. Ended the game better than most of the other participants.

3.2 Findings

We examined all three instruments in this chapter, and the results show that approximately more than 70% of our participants who provided us with all types of data collection are critical thinkers. Our research study's objective is to investigate the role of video games in shaping EFL learners' critical thinking. Therefore, we provided various analyses that revealed positive signs to confirm this hypothesis.

Starting with the questionnaire; the majority of our participants believe that video games improve EFL learners' critical thinking. Additionally, above the average of these participants reported to have higher grades since they started playing multiple types of video games. If we look at figure 02, figure 03 and figure 04 at the same time, we will notice that some of the reasons behind their good grades is the fact that they elaborated multiple brain skills from playing several types of video games such as strategy video games, action video games and few advantageous sports video games, and this implicates to both males and females.

Our objective when we elaborated the questionnaire was to find out first whether the participants' believe that video games improve brain skills and particularly the critical thinking, and second to determine what is the main brain skill that comes to the participant's mind when we mention video games. The obtained results were satisfying, and we notice that almost all participants are aware of the positive aspects of video games. Additionally, some participants took the opportunity to talk about their past experience with video games and how those video games positively affected their lives, not only in their personal life but also their life as EFL learners, and we used their comments as a backbone to reinforce the hypothesis of our work research.

After proving that video games improve the critical thought. The researcher's second aim was to know which mind skill would the EFL learner chooses to develop from playing video games and which one would he prefer to have in his daily life. Fortunately, Almost every participant chose to develop the critical thinking. Additionally, the participants rather use video games as a tool to enhance their critical thinking rather than using other tools, saying that it is the most fun and quick way to reach this objective. This means that the participants are fully agreed with what we are trying to prove.

Before collecting this data, the researcher was anticipating a certain problem, which is the difference in gender. And this is the reason why we included females in our research, to find out more about our thesis. Most people agree that females' strong points is definitely not

playing video games. Moreover, we obtained the same results from man as from females, and even similar comments, which proves that gender is not a problem and we will get the same outcome when playing video games regardless of the person's gender.

The main objective of our research is to investigate the role of video games in enhancing the EFL learners' critical thinking. Nevertheless, we deduced that there are other competences and brain skills that can be improved by playing video games. Even the few participants who did not agree with our thesis, believe that there are other positive aspects that come from playing video games such as enhancing the memory, communication abilities, improving attention and concentration, developing multitasking skills and many others.

Concerning the in-game observation, we tried to illustrate the game in a line graph to give a simple understand of how we scored the participants. Although, it was not enough to demonstrate the game, we still obtained the desired results during the game itself. Clear signs of communicational and critical thinking competence were identified such as good map reading, right decision making, clarity and several other skills.

Overall, the results reveal that participants' perceptions and beliefs support our research hypothesis. After examining the time the participants answers and comments and investigating the time they spend playing video games, noticeable critical thinking have been identified on these EFL learners.

3.3 Conclusion

As a conclusion, the results we have got in this chapter were all analyzed from the questionnaires, interview, and an in-game observation. We discussed the findings of our collected data in order to obtain further explanation and a better insight, we also illustrated several and different types of graphs, the purpose behind using various graphs is to ensure that our data is demonstrated in the most suitable way. In the end, we compared the results we obtained from each data collection material and noticed clear signs that we used to reinforce our hypothesis.

General Conclusion

The following study attempted to investigate the positive effects of video games on EFL learners. In fact, this research's primary objective was to investigate the possibility of using the most popular digital and entertainment platform that is video games as a tool to enhance EFL learners' critical thinking. Another major objective was to find out if video gaming could be considered as a constructive educational learning environment. Additionally, we explored different types of video games to identify which one is the most convenient to develop brain skills that could be used by EFL learners.

To investigate our research topic, we focused on shedding light on the positive effects of video games on EFL learners, and to what extent they are beneficial. Many factors were taken into consideration. The first two factors are the time and energy that are spent every day in playing video games. The second factor is the educational process, where we asked questions about the educational environment of the EFL learner. The final of our research project was the type of the video games that can enhance critical thinking skills, and then we identified the different results behind the use of each type of video games.

This research project was divided into three chapters. The first chapter introduced the theoretical background of the research work. The second chapter is the practical part of our research study. To carry out our investigation, we used three data collection materials. The first instrument was a questionnaire; its primary objective was to find out if License and Master students at the University of Abdelhamid Ibn Badis are familiar with video gaming, and do they believe that playing video games is beneficial. The second objective was to have an idea about the learners' point of view concerning video games, and if these learners are aware of the critical thinking competence. Our second data collection material was an interview, where we conducted several interviews with learners from both gender to have more insight about video gaming and its relation with critical thinking. And our third instrument was an in-game observation, where we used the online game video game "League of Legends" to form multiple groups of five players each including the researcher and analyze their movements and decision making during the game and converted their actions in a line graph to illustrate what we saw so that our readers understand our in-game observation.

In the third and last chapter of our research, we analyzed the collected data from the three instruments that we used in our study. As expected we have found remarkable results that

support our hypothesis. Mainly, these results are not only is not reliable to EFL learners but also to people of all ages.

Nonetheless, it is important to mention that our hypothesis's results apply for people who play certain types of video games that we highlighted previously. Furthermore, video games offer constructive features over the learning process for the users, but it also depends on how the users organize their time. There are also many factors that need to be checked in order to obtain convenient results. In this regard, we wish that our research project would pave the way for investigating other aspects related to video games and critical thinking.

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Appendices

The Questionnaire

Investigating the role of video games in shaping EFL learners critical thinking

This questionnaire represents a necessary part of my dissertation. Its main objective is to find out whether there is relation between video games and critical thinking or not. Furthermore, to investigate the potential of video games to improve EFL learners' critical thinking. Would you please answer the following questions:

1 – Are you a:

Male ☐ Female ☐

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2 – **Your age?** **. . . . .**

---

3 - What type of video games do you play the most?

- Strategy video games ☐
- Sports video games ☐
- Action video games ☐
- Simulation video games ☐

---

4 - To what extent are you familiar with video games?

☐ Very familiar

☐ Somewhat familiar

☐ Not familiar

5 – What is your aim in playing video games?

……
……

---

6 – Has playing video games affect your critical thinking?

☐ Yes ☐ No

If yes, what changed?

……
……

---

7 – Did the type of video game you play affect your English module grades?

☐ Yes, it did ☐ No, it did not

---

8 - What is your opinion about video games' impact on the different mind skills?

……
……