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**DIGITAL GAMES AND L2 VOCABULARY LEARNING: AN EXPERIENCE WITH
ELEMENTARY SCHOOL STUDENTS**

Florianópolis, 2024

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O presente trabalho em nível de mestrado foi avaliado e aprovado por banca examinadora composta pelos seguintes membros:

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Certificamos que esta é a versão original e final do trabalho de conclusão que foi julgado adequado para obtenção do título de Mestre em Inglês: Estudos Linguísticos e Literários.

Coordenação do Programa de Pós-Graduação

Profa., Dra. Mailce Borges Mota Orientadora

To my family.

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ABSTRACT

Vocabulary learning is the first stage to learn a second language, and digital games are the experience that young learners face daily. Therefore, the present study aimed at investigating if digital games could enhance L2 vocabulary learning in comparison to paper and pencil activities. To reach this objective, the hypothesis pursued in the present study was that participants from the experimental group exposed to L2 target vocabulary would be more inclined to retain the target words than the control group, which was exposed to daily classroom activities. The participants of the present study were 16 students attending the sixth grade in a public school in the city of São José (SC). Eight participants were assigned to an experimental group, while 8 participants were assigned to a control group, randomly. The experimental group was exposed to the target words through the game Fast Vocabulary, while the control group was exposed to the same target words through classroom activities. Thus, the procedure was designed in three phases: pretest, intervention, and post-tests. The results showed that there was no significant difference between groups. Thereby, the hypothesis was not confirmed. In addition, the control group showed a significant improvement regarding L2 vocabulary knowledge. These results were interpreted as an indication that, at least for the participants of the present study, daily classroom activities were the most suitable method for L2 vocabulary learning in comparison to digital games.

Keywords: L2 vocabulary learning, digital games, games and L2 language learning, Fast vocabulary.

RESUMO

A aprendizagem de vocabulário é o primeiro estágio para a aprendizagem de uma segunda língua, e jogos digitais são experiências às quais jovens aprendizes presenciam diariamente. Portanto, o presente estudo investigou se jogos digitais poderiam promover o aprendizado de vocabulário em uma L2 em comparação com atividades de lápis e papel. Para alcançar tal objetivo, a hipótese era de que os participantes do grupo experimental expostos as palavras alvo na L2 estariam mais propensos a reter palavras do que o grupo controle, o qual foi exposto as palavras alvo por meio de atividades de sala de aula. 16 participantes desse estudo estava frequentando o sexto ano de uma escola pública na cidade de São José (SC). Oito participantes foram designados a um grupo experimental, enquanto oito participantes foram designados a um grupo controle, ambos de forma aleatória. O grupo experimental foi exposto à palavras alvos na L2 através do jogo Fast Vocabulary enquanto o grupo controle foi exposto às mesmas palavras alvos através de atividades de sala de aula. O procedimento para coleta de dados foi delineado em três fases: pré-testes, intervenção e pós-testes. Os resultados mostraram que não houve diferenças significativas entre grupos. Assim, a hipótese não foi confirmada. Contudo, o grupo controle apresentou um aumento significativo em relação a retenção de vocabulário na L2. Esses resultados podem indicar que atividades de sala de aulas podem ser o método mais adequado para aprendizagem de vocabulário na L2 em comparação a jogos digitais.

Palavras-Chaves: Aprendizagem de vocabulário na L2, jogos digitais, jogos a aprendizagem de línguas na L2, Fast Vocabulary.

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LIST OF ABBREVIATIONS

L2 - segunda língua

PM- picture matching

TR- translation

TCLE- Termo de Consentimento Livre e Esclarecido

TALE- Termo de Assentimento Livre e Esclarecido

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CHAPTER I

1. INTRODUCTION

It was during a master's degree defense that I heard from one teacher that when we do research and a master's degree, for example, in some way we are always telling a story of our own. Even when we are carrying out research, we should incorporate ourselves in the writing as well. Thus, in the subsequent lines I explain why I am pursuing my master's degree.

The idea to investigate L2 vocabulary learning and digital games emerged from a deep personal conviction. I wanted my research to contribute to the educational reality of our country. As a former public school student, I feel a strong sense of duty to advocate for and give back to that educational environment, which played a significant role in my own learning and personal growth. It represents my primary path of development. Thus, with the aim of contributing to L2 language learning in public schools, I decided, with the support of my advisor, to explore the role of digital games in language learning in the school curriculum, considering students' exposure to the digital world.

Combining the real world of these digital natives (PRENSKY, 2001) with L2 vocabulary learning may promote a better understanding of games for learning. Furthermore, the choice to focus on L2 vocabulary learning is due to the fact that it is a dimension of language that is explicitly taught at Brazilians public schools in the first years of English classes. As stated by Barcroft et al (2011, p. 576), "vocabulary can be seen as the language building box" in L2 language learning. In this sense, learning vocabulary means learning the foundations of a second language.

Combining L2 language learning with digital games appears to be fundamental since we live in a technological world where children are born digital natives due to their early contact with technology. Besides that, many children play digital games everyday, getting so involved with the game that they forget their daily duties. Thus, there must be something in games.

The present study aims to investigate the effects of the use of a digital game on L2 vocabulary learning by 6th grade students of English. The specific objective of the study was to investigate if the digital game Fast Vocabulary (DWYER, 2010) would lead to a higher L2 vocabulary retention compared to classroom activities in a population of 16 young learners of English, who were attending the 6th grade of a public school in the city of São José (SC).

To reach this objective, the following research questions were proposed to be investigated:

1. How do digital games, compared to daily classroom activities, contribute to the learning of L2 (English) vocabulary in the school setting?

2. For Brazilian sixth grade students learning English in the school context, does the use of the Fast Vocabulary game lead to higher L2 vocabulary gains than the use of classroom activities?

The following hypothesis was investigated: Hypothesis 1: Compared to learners exposed to daily classroom vocabulary activities, learners exposed to the game Fast Vocabulary will be more inclined to retain the target vocabulary due to the central characteristics that the game presents. This hypothesis is related to the characteristics that games have. Butler (2019, p. 1) states that games present features that are central to learning, such as clear goals, feedback, and challenges. Besides that, games can be a motivational source for learners and reduce their anxiety (THOMAS, 2012). In such a way, these features are important factors to consider in a learning environment. Furthermore, games contain design, songs, images, letters, phrases, sounds, and rewards which evokes learners' sensory stimulus (RAMOS; LORENSET; PETRI, 2016). This means that by using digital games learners may be more instigated and motivated to learn. Moreover, previous studies (MILLER, HEGELHEIMER, 2006; AGHLARA, TAMJID, 2011; SALAVATI, SALEHI, 2016; MOHSEN EBRAHIMZADEH, 2017; HAO- JAN HOWARD CHEN, HSIAO- LING HSU, 2019) indicate that digital games improve L2 vocabulary learning. However, not all of these studies compared classroom activities for learning with digital games, but all of them proposed an investigation regarding L2 vocabulary learning/retention and the use of digital games

1.2 SIGNIFICANCE OF THE RESEARCH

This research aims to investigate L2 vocabulary learning through a digital game. Thereby, this research may promote a better understanding of the use of games for learning, critically approaching their potential and weaknesses. Moreover, this research may shed some light and demystify beliefs that games cannot be a source of learning. Finally, this may contribute to the field of English as L2 learning and the use of technology/games for learning.

The proposal for the use of digital games is because they can be a powerful source of learning (BUTLER, 2019, p 1). Furthermore, Xu *et al* (2016) pointed out that most of the

games used in research concerning digital games and L2 vocabulary learning are not educational and free-available games, but commercial games. Commercial games are games created to entertain, but they can be used as a pedagogical resource. However, these games require qualified equipment and stable internet connections which are issues that may not be present at public schools. In this perspective, this research aims to use what is available to public schools. Thus, for this study, a freely-available game was used because it does not require a fast and stable internet connection nor a qualified computer. In this way, this research not only contributes to the field of L2 language learning, but it considers a realistic setting to implement technological resources.

1.3 ORGANIZATION OF THE THESIS

The present thesis is organized into five major chapters. Chapter I is dedicated to present the context and to introduce the research. Chapter II presents the review of literature and is subdivided into 6 subsections: the definitions about digital games, the classification and genres about games, learning theories in games. Followed by theoretical discussions about L2 vocabulary learning, the relationship between digital games and L2 language learning and a brief report of how L2 language learning occurs at a public Josefense school.

Chapter III details the objectives, research questions and hypotheses pursued in the present study. In addition, it describes the method and general procedures adopted in the study.

Chapter IV reports and discusses the results obtained in this research, including the descriptive and inferential statistical analysis of participants' performance on L2 vocabulary tests. Then, it readdresses the research questions.

Chapter V presents the final remarks of the study. Firstly, it portrays a summary of the main findings of the study. Then, it describes some limitations of the study and proposes some suggestions for further research. Finally, it concludes with the methodological, pedagogical implications of the present research, followed by a brief personal report concerning the data collection process.

CHAPTER II

2 REVIEW OF LITERATURE

This chapter presents the theoretical background for this study and is organized into six major sections. Section 2.1 presents a discussion concerning the definitions about games. Section 2.2 reviews the classifications and the genres of games. Section 2.3 presents the learning theories inserted in games. Section 2.4 consists of a theoretical discussion about L2 vocabulary learning. Section 2.5 addresses the relationship between digital games and L2 vocabulary learning. Section 2.6 gives an overview of English teaching at a Josefense public school.

2.1. DIGITAL GAMES AND DEFINITIONS

Digital games are a broad term. The literature presents various definitions and some of these were selected to be discussed in detail in this section.

Defining what constitutes a game, without including the term “digital”, has been a subject of extensive discussion in literature. Some researchers consider games as a form of play, and in some cases, there is no clear distinction made between a game and play. Therefore, it is necessary to enlighten this issue by examining the chronological progression of definitions, as outlined by Salen and Zimmerman (2004). This chronology begins with David Parlett, continues with Clarck C, Abt, Johann Huizinga, Roger Caillois, Bernard Suits, Chris Crawford, Greg Costikyan, Elliot Avedon and Brian Sutton-Smith and concludes with Salen and Zimmerman’s definition (2004) .

Parlett (2004) argues that games consist of ” ends and means”. “Ends” refer to the manner in which a goal is achieved, and, if the goal is attained, the player wins. “Means” refer to the procedural rules that are manipulated in order to achieve victory (p. 4). Abt (2004) defines a game as an activity involving two or more independent decision makers, where the objective is to achieve a goal within a limited context. Taking these two definitions into consideration, it becomes apparent that they complement each other. Both authors conceptualize games as activities with defined goals. However, Abt (2004) introduces the element of “decision making”, recognizing that games involve continuous active participation by the player. Nonetheless, it remains a relatively simple definition of what a game is.

In addition, Huizinga (2004) states that “play” is a system of free activity. This activity proceeds by means of fixed rules and proper boundaries of time and space. He emphasizes that games are voluntary activities characterized by their inherent freedom.

Caillois (2004) also states that play is free, otherwise, the play would lose the sense of joy. He also uses some categories to describe games such as: separate, uncertain, unproductive, governed by rules, and make believe. Thus, play is further characterized by being “separate”, as it operates within defined boundaries of space and time. It is “uncertain” due to the active participation of players, therefore, it is not possible to determine the result beforehand. Additionally, play is “unproductive”, meaning it involves the exchange of property among players rather than the creation of something new. It is “governed by rules”, with these rules indicating the possibilities within the play. Lastly, play is “make-believe”, involving an understanding that it exists in an unreal environment. It is important to note that this author is referring to a game as a form of “play”.

Suits (2004) discusses that playing games is composed of: an activity in which the objective is to achieve a goal by means of specific and accepted rules. An important aspect to consider regarding Suits’ definition is that he is not defining a game itself, but the act of playing it.

Crawford’s (2004) description of games include four key elements: representation, interaction, conflict and safety. The representation consists of games representing a form of reality. It is viewed as a system that operates with explicit rules. He points out that games are interactive by nature, allowing players to engage with the world and experience changes while playing and exploring this fictional environment. The conflict appears naturally inside the game. Games typically present a goal, and obstacles or challenges prevent players from easily achieving that goal. Conflicts can manifest in various ways, whether direct or indirectly. The safety aspect in games proposed by Crawford’s is that despite the presence of conflict implying danger, risk, and harm, games provide a safe environment for players to engage with these emotions. Hence, this author presents a more intricate and specific understanding of what constitutes a game. He highlights the crucial notion that games offer a safe space for emotional engagement, even when they involve conflict and challenges.

Costikyan’s (1994) defines a game as “a form of art in which participants, termed players, make decisions in order to manage resources through game tokens in the pursuit of a goal” (COSTIKYAN p. 1). This aligns with the previous definitions. He emphasizes that games involve actions, decisions and the presence of goals. Costikyan’s definition also adds an interesting perception by framing games as a form of art.

Avedon and Sutton-Smith's (1971) define games as "an exercise of voluntary control systems, in which there is a contest between powers. They are confined by rules in order to produce a disequilibrium outcome" (p. 405). Indeed it provides a powerful perspective. This definition highlights that playing games involves the operation of control systems, making games a physical and intellectual activity. It underscores the idea that games are merely leisure activities, but also involves an exercise from more complex systems.

Finally, after presenting some definitions of what constitutes a game, Salem and Zimmerman (2004) offer their definition: "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome". Hence, they view games as systematic constructs that provide safety within an artificial conflict that is defined by rules. The outcomes are measurable, often leading to rewards for the players.

In spite of extensive discussion within the field and various perceptions of what constitutes a game over time, Butler (2019), for instance, defines a game as a form of "play with goals and rules". She acknowledges that this definition may seem broad, but it reflects the ongoing lack of consensus with the field regarding the precise definition of what a game is.

In addition to that, Silva *et al.* (2009) argue that the challenge to define "games" arises from the broad glance attributed to the term. They explain that games are perceived as plays, challenges, competitions, and so on. Consequently, defining games depends on the perspective from which one views them.

Furthermore, Silva *et al.* (2009) elaborate a well constructed definition of games. They define games as "an interactive system that is organized by means of implicit or explicit rules with measurable consequences, that generates emotions and that evokes fun for the players" (p. 9). This definition views games as structured systems that not only stimulate players' emotions but also classify them as a source of entertainment. As a result, the definition proposed by Silva *et al.* (2009) will be adopted in this study.

Finally, to define what turns a game to be digital, Ramos *et al.* (2016) explain that it must be based on bits, composed of images and sound. For them, digital games or electronic games are classified according to their platform. Thus, for a game to be digital or electronic it must be used on personal computers, consoles, or mobile devices. While what turns a game non-digital is their platform as well. For example, if a game is used through cards or boards, they are a non-digital game (p. 6).

2.2 DIGITAL GAMES, CLASSIFICATIONS AND GENRES

Besides the vast definition of games, they are also categorized into various genres. These encompass simulation games such as *The Sims*, puzzles games, action games, and so on. Moreover, games can be included into other categories: commercial games or educational games.

Commercial games are games that were designed for entertainment purposes. It usually presents high quality concerning the graphics, sounds, images and the functioning of the gameplay is complex. In some games, for example, each action during the game can turn it into different results of the game story.

An educational game is a game created to teach. These games can vary in many areas of learning, there are games teaching History, Chemistry, Biology, Languages, Mathematics, etc. Usually these games are created by groups of teachers which do not receive much investment. Thus, these games usually present an inferior design and the gameplay is simpler, with less or none possibility of different results regarding the players choices or actions.

Having presented the difference between games and the types of games, the objective to use a digital game in this research is in the line of Prensky's perspectives of what he names "digital natives" (2001, p. 1). As this new generation is getting more globalized, and the use of technology is spreading while children are very young. Digital games can be seen as a source to accommodate what is already a real world for students. Moreover, it is necessary to understand if there is any impact in students' learning through digital resources, such as games. Therefore, I am willing to understand if there is any significant difference between learning from a digital device or a teacher with regular classroom activities.

Concerning the use of games for learning, Thomas (2012, p. 11) argues that digital games can be seen through dichotomies. They can be seen as a pedagogical tool to teach students; they can allow students to communicate without the pressure of using correct linguistic structures; they can reduce anxiety; they can be motivating, and they can provide a comfortable atmosphere to introverted students. On the other hand, digital games can be seen as "filling the gap" on rainy days. Besides that, the author states that digital games can be seen by the school's direction as something enjoyable and not educational.

In counterpoint to this negative perspective of games, Butler (2019) states that games can be a powerful source of learning due to their characteristics. She argues that games present features that are central to learning, such as "setting clear goals, providing visible outcomes, instant feedback, challenges and tasks that lead to collaboration and interaction"

(p. 1). Thus, is there something in games that make them special or are there some issues of games missing in school and we need to learn from them? The next section discusses the learning theories behind games and how games present some principles of learning in their design.

2.3 DIGITAL GAMES AND LEARNING THEORIES

According to Homer *et al* (2019) games present several learning theories, including behaviorism, information processing theory and constructivism. Behaviorism in games can be seen clearly, since this theory posits that behaviors are driven by rewards and punishments, with rewards reinforcing behaviors and punishments discouraging them. Thus, games frequently present situations in which actions are reinforced or punished. For instance, when players accomplish the tasks, they are often rewarded with positive outcomes, such as advancing to a higher level, obtaining new objects or unlocking further progression in the game's storyline.

On the other hand, failure in games often results in player's punishment, typically requiring the player to repeat the phase or the challenge. Homer *et al* (2019) also discuss two forms of reinforcement in games: continuous or intermittent reinforcement. Continuous reinforcement refers to the player's actions during the game, meaning that each positive action from the player will result in some positive outcome. In contrast, intermittent reinforcement is associated with specific moments when players receive positive feedback due to their actions, usually this happens at the end of an important phase of a game. An example that illustrates these types of reinforcement can be seen in Super Mario Bros when new areas of the Super Mario's world or "city" are unlocked. These reinforcements strategies are designed to maintain the player's motivation and engagement with the game.

In the context of information processing theory, it is argued that games send a lot of stimuli to the player. Through attention players may select the most relevant stimuli for further processing in short-term memory. In short-term memory players will coordinate the information received and work their skills to achieve the game's objectives. Repeating this process players will present cognitive change with new information that will be encoded in long term memory.

In addition, Homer and colleagues (2019) establish a connection between games and working memory. Baddeley (1992) presents a model of working memory. This model involves two storage systems, a visuospatial sketchpad for visual and spatial content. And a

phonological loop for auditory (mainly verbal) content. Also, a central executive that controls the limited capacity of the subsystems. Thus, when someone plays a game, images and audio or verbal content are sent to both domain-specific subsystems that facilitate information processing.

Another important author to mention is Mayer (2002, 2009), who proposes the cognitive theory of multimedia learning. According to him, the splitting information between the visual and auditory channels enhances learning by not overwhelming the limited capacity of either channel. Thereby, this allows learners to actively filter, select and organize the information in long-term memory.

Moving to constructivism theory and sociocultural principles, Homer *et al* (2019) based on Piaget and Vygotsky work propose that knowledge is constructed by learners themselves, through assimilations and the creation of proximal development zone (ZPD). Moreover, the author explains that games present situated and constructed meanings through interactions. Thus, with the sociocultural principle the learner is posited in problem solving situations, while experiencing real or possible situations. For example, when a learner is a doctor in a game, he or she will learn by situated meanings and exercise problem solving.

Another important characteristic that needs to be addressed about games are the learning principles argued by James Paul Gee (2005). He states 16 principles of learning that are inserted in what he calls “good games”, and according to him these characteristics should be inserted in school’s curriculum. The principles are: identity, interaction, production, risk taking, customization, agency, well ordered problems, challenge and consolidation, “just in time” and “on demand”, situated meanings, pleasantly frustrating, system thinking, explore think laterally, rethink goals, smart tools and distributed knowledge, cross functional teams. and finally, performance before competence. All of these principles will be discussed in this section

The first principle, “identity”, is related to the ability that games present to create a connection with the player. The player will keep playing if a connection or a sort of identification is mastered. In this sense, Gee (2005) argues that school should create means of identity between the subjects and students.

The second principle is interaction. In this principle it is possible to consider an online game or off-line game, both of them will present strategies to interact with the player. There will be feedback, new clues or chats between players around the world. Thereby, he points out that school should be interactive, it should allow students to feel instigated to participate in the classroom, without the aura of passivity that emerge in the classroom, currently.

The third principle called “production” is about players' actions which have value in games. Their actions will result in some production. According to Gee (2005), players can “co-design” the game. It can be done through an answer or when they create a new scenario in the game. For example in *The Sims*, you can create new houses, community lots as the players wish, allowing freedom to the players to change their purposes inside the gameplay. In this perspective, Gee (2005) explains that schools should create more space for production.

The fourth principle is risk taking, this characteristic is fundamental in games and according to the author, it should be inserted in pedagogical terms. Students should try to take risks and not be afraid of mistakes. However, students often participate in class when they know they are right, otherwise they avoid participating when they are uncertain or fearing making errors. In this sense, games demonstrate a more advanced approach compared to schools. Players are more willing to take risks and persist, even in the face of failure. In fact, failures in games are deliberately designed by game developers. Failure serves as a crucial part to maintaining players' motivation and engagement.

The fifth principle is customization, players have the freedom to change their path during the game or to change the character styles. On the other hand, Gee (2005) points out that schools present a fixed curriculum that does not allow students to choose different subjects that are in line with students' real interests.

The next principle is agency. This principle is related to players' feeling of control in games. They feel completely part of the narrative. They are the main agents which are completely different in schools. Taking my personal experience as a teacher, for instance, students are usually far from this place of “agency”, they usually feel distant from the subjects and most of the times complain that they see no reason in studying.

The principle of “Well-ordered problems” is related to the ability that games have to present problems to players which are increased by the difficulty of problem solving. As a result, games usually begin with relatively easy challenges that progressively become more complex. So, earlier challenges often serve as stepping stones to solving future obstacles. This approach provides more opportunities for problem-solving and critical thinking.

The principle of “challenge and consolidation” is the continuous cycle of presenting challenges to players which they must solve. However, this process never truly ends. Games continually demand that players solve new challenges while also mastering the skills and solutions from acquired previous ones. Consequently, games reinforce and consolidate old knowledge with new experience. Gee (2005) suggests that this should be incorporated into schools.

The “just in time” or “on demand” principle is about providing verbal information “just in time” or only when the player requires. Gee (2005) reports an example of school textbooks. According to the author, school textbooks are composed of extensive verbal language and nonverbal information, and people often struggle with many words and information since it demands considerable effort to process both the words and the information presented. To overcome these issues, information or content could be presented in a more concise and straightforward manner. It could have positive impacts on schools. It could make learning less intimidating for students who often feel overwhelmed by extensive information found in school textbooks.

The situated meaning is a principle of understanding a word's meaning through context not only by its definitions. Thus, the author argues that learning should be always inserted in context.

Pleasantly frustrating is the principle of challenging the players in a way that maintains the player motivated and prevents them from quitting the game. The challenges of games are usually well balanced. However, the author explains that schools often face the challenge of accommodating students with varied levels of proficiency. This issue is evident in context as English classes in Brazil, for example. Classes are often composed by a mix of students with different proficiency levels, making it difficult to challenge the entire class properly.

The principle of system thinking involves players thinking about their actions and choices during gameplay and how each action will impact future experiences. Consequently, Gee (2005) states that this is a characteristic that should be effectively integrated into educational settings. Students should be encouraged in active learning, critical thinking, problem solving, and connecting concepts to subsequent contents.

The explore, think laterally and rethink goals refers to encouraging players to explore and experimenting before advancing to the next challenge. These principles promote lateral thinking rather than linear thinking.

The smart tools and distributed knowledge concerns the way that games are designed to distribute knowledge. For instance, each character may have an exclusive skill, and this is lent to the player. The player does not need to learn that skill, instead, he needs to understand how and when to use it properly.

The cross functional teams principle is related to how games value different skills and abilities. Players are aware that each character or team member possesses specific weaknesses and strengths, and they appreciate these differences. By working together, they

can effectively solve challenges presented in the game. This concept should also be valued in educational settings because students often have specific and unique abilities. By collaborating, students could achieve their learning objectives together.

In the last principle called performance before competence, Gee (2005) states that games operate through principles. Players can perform, explore, receive support and be stimulated by the game design before players achieve their desired outcomes.

Considering these principles, it can be argued that games are well designed tools that offer complex learning experiences. In games, players have a safe environment to explore, mistakes are viewed as part of the journey, players are consistently encouraged to persevere, feedback is immediate and rewards are consistently present. Unfortunately, when we compare this to the reality of schools, many of these elements are missing. In most schools mistakes are not well appreciated, students may feel discouraged from exploring. As a result, the school environment can become less enjoyable.

On the other hand, it is important to acknowledge that achieving all these principles in schools can be challenging. The everyday reality of schools, especially public Brazilian schools, can be demanding and difficult.

Furthermore, after discussing the famous learning principles in games proposed by Gee (2005), it turned out to be difficult to find what he calls a “good game” with such complexities to use as a source of teaching. However, this will be explained in detail in the next chapter.

Thus, after this discussion of what games are, and the features presented in games Van Eck (2015) argues that it is evident that digital games can enhance and contribute to learning due to many research that was conducted, some of them to enhance reading, spelling, domain-specific learning outcomes, mathematics, biology, or cognitive abilities as spatial visualization, for example. Moreover, the author points out that the question that needs to be answered from now on is “What games can best teach and why” (p. 16). Although it seems that research has already shown that digital games can be positive for learning, there is still a huge gap, Xu *et al.* (2019), in a scoping review, discussed that there are a considerable number of studies about digital games and language learning, and most of them are about vocabulary learning. However, there is a lack of details regarding the structures of the research and methods. Xu *et al.* (2019) point out that in many studies information about participants' age are not given, details about the game that was used are not presented, and that there is a lack of pre-tests to measure and investigate how participants performed before the experiments. In addition, there is a lack of standardized vocabulary tests. From this

perspective, it is understood that there is much research in the field, but there are still inaccurate results.

2.4 LANGUAGE LEARNING AND DIGITAL GAMES

Miller and Hegelheimer (2006) investigated a game simulation, *The Sims* - a life simulation game- in terms of language learning potential. The objective of the study was to verify if a simulation game could enhance L2 vocabulary learning with the use of supplemental materials. Thus, they compared six groups with three participants in each group (18 intermediate learners from different backgrounds in total) to be part of the research. Each group had three moments: (1) play the game with the support of supplemental materials, (2) play the game and access the supplemental materials, optionally and (3) play the game without the use of supplemental materials. The result showed that a simulation game with the use of supplemental material fostered L2 vocabulary learning. This means that being exposed to the words and being explicitly taught resulted in higher retention of L2 vocabulary learning.

Lorenset and Tumolo (2019) investigated the use of the game “*The Sims*” for L2 vocabulary acquisition. In this study, there were 8 gaming sessions, including the pre-test post-tests, and delayed post-tests. Moreover, there were participants' narratives concerning their vocabulary gained through the game “*The Sims*”. There were 19 participants, all of them were beginners and they were enrolled in high school integrated courses at the Federal Institute of Santa Catarina (IFSC). Their age varied from 15 to 18 years old. The results showed positive results regarding participants' L2 vocabulary retention.

Furthermore, Aghlara and Tamjid (2001) investigated foreign language vocabulary retention using “*SHAIEX*”, a digital computer game. They compared two groups, one learning vocabulary through “*SHAIEX*” and one group learning vocabulary through traditional methods of learning. The participants were 40 seven years old girls. The results showed that the experimental group who was using the game recalled more vocabulary items than the control group. Thereby, this research has a fundamental impact since their proposal is quite similar to this project's proposal.

Salavati and Salehi (2016) investigated foreign vocabulary learning through video games in comparison to traditional methods of learning. The participants were 32 male and 43 female, between thirteen to thirty-one years old. The games were retrieved from the website “gamestolearnenglish.com” (a website with freely available games). Moreover, the

experimental group played the game and received a booklet containing a list of fifty new words, while the control group received only the booklet. The results showed that the experimental group which used the video game had higher retention of vocabulary learning in comparison to the control group that used traditional materials. In this way, this research is interesting due to the use of a freely available game. This means that a game with a simple design was used to teach L2 vocabulary.

Mohsen Ebrahimzadeh (2017) did comparative research with groups of readers, players, and watchers regarding foreign vocabulary learning. There were 241 male participants. The game used was “Warcraft III: The Frozen Throne”. Their results indicated that players and watchers recalled more vocabulary items than readers' groups. This means that a different approach for L2 vocabulary learning may be more suitable than a traditional approach as vocabulary through reading.

Hao-Jan Howard Chen and Hsiao-Ling Hsu (2019) researched the use of computer games in foreign vocabulary (English) learning and learning of history. There were sixty-six participants (twenty-six male and forty female) from a university in Taiwan. The result showed that, in post-tests, participants had higher retention of vocabulary and achieved higher knowledge of historical content in comparison to pre-tests, indicating that participants could learn language and content.

Concerning the type of games that are used in studies about L2 vocabulary learning, most of them are commercial games (Xu et al, 2019). Commercial games are games that were not created for educational purposes. Although these games were created to entertain, they can also be used as a learning tool. However, for the purposes of this study, commercial games are not viable to be used at public schools. These games usually require a stable internet connection, a qualified computer and they are mostly designed for native speakers of English, which requires advanced knowledge of the language to be able to understand and to solve the challenges of the game (Chen; Hsu, 2019, p. 3).

On the other hand, Xu *et al* (2019) found that freely available games were much less used, which are games that are not necessarily designed for educational purposes, but they are available on browsers/online platforms. Henceforth, in this research, the digital game *Fast Vocabulary* (DWYER, 2010) will be used. It is freely available on browsers/online platforms and the choice of this game was due to two reasons. Firstly, the use of a freely available game is the most reasonable choice due to the public school's context regarding its equipment because they do not require a stable internet connection nor a qualified computer. Moreover,

as this game is freely available it can be used for teachers and researchers if they want to replicate this research or if they want to test/use the game in their classroom.

As this study aims to understand digital games' implications for L2 language learning, the next section will briefly present a theoretical discussion about L2 vocabulary learning.

2.5 L2 VOCABULARY LEARNING

To understand how L2 vocabulary is learned it is crucial to discuss what words are and how to better approach L2 words regarding young and beginner learners. According to Barcroft *et al.* (2011) “Words are the building blocks of language, and linguists increasingly point to the inextricable role of words and lexical phrases in the projection and construction of syntax. Vocabulary is also indispensable when it comes to successful communication” (p. 576). This means that words have immense importance to construct the syntax of a language since vocabulary is a fundamental component regarding communication and understanding. Furthermore, “building up a useful vocabulary is central to the learning of foreign languages at the primary level. A lot of important grammatical information is tied into words, and learning can take students a long way into grammar” (CAMERON, 2001, p. 72). This means that if a priority is given to vocabulary development, grammar is not being abandoned. Also, vocabulary can serve as a stepping stone to learning and to the use of grammar.

Vocabulary can also be divided into receptive and productive vocabulary knowledge, both are important and will be exercised through vocabulary exposure and encounters of words. Receptive vocabulary knowledge refers to words that are encountered while listening or reading and that are understood by a learner. Productive vocabulary knowledge refers to the use of words while speaking and writing where lexical items must be used accurately (GONZÁLEZ- FERNÁNDEZ and SCHMITT, 2017. p 284).

Moreover, L2 vocabulary learning involves exposure and many encounters with the word in various contexts (González- Fernández and Schmitt, 2017. p 282). Also, to foster word knowledge it is important to consider words' frequency because they are more suitable to be retained (BARCROFT *et al.*, 2011. p 573). It is argued that a frequent word can be recognized faster than an infrequent word. Moreover, word family can also be a factor related to the speed of mental access. A word with many word families (derivations) can be slower accessed than a word that has fewer word families (BARCROFT *et al.*, 2011. p 573). Thus, these issues must be considered when approaching vocabulary in research.

In this study, due to children's reduced contact with English, vocabulary learning will be investigated at the receptive level. Furthermore, in the present study I adopt Grosjean's (1989) view of bilingualism. Taking an inclusive perspective, Grosjean (1989) argues that bilinguals are not two monolinguals in one person. Instead, bilinguals are people who use more than one language in their daily lives (1989, p. 4), independent of the amount of use and age. Therefore, for a long period bilinguals were viewed as people who could use a language proficiently at all levels, Grosjean enlightened the field of bilingualism arguing that for many reasons and different scenarios bilinguals may or may not master all levels of a language because they have different objectives and needs. Thinking in Brazil, learners of English as L2 in elementary public school are at a low proficiency level, this does not disqualify them as less or no-bilinguals because they are inserted in a context where they interact in another language through different means writing, listening, reading or talking. This in turn is sufficient to name them bilinguals.

Following this brief overview, the next section will present a discussion of vocabulary learning at public elementary school from a reported and experienced perspective.

2.6 VOCABULARY TEACHING AT THE SCHOOL SETTING

Having in mind that data collection of this research takes place at a public Josefense school, it is important to describe how English teaching occurs. To describe this section a personal tone will be added to inform how English and L2 vocabulary teaching is presented to students.

The participant school of this research is a state school. Hence, it follows the *Base Nacional Comum Curricular* policy (BNCC, 2017). This document outlines the specific content students are expected to learn based on their grade levels. Moreover, the BNCC document describes which abilities students may improve. However, teaching methods are based on teachers' choices.

Speaking from my perspective as a current teacher at Josefense public school, the process of English teaching typically unfolds as follows: the content is introduced to the class using the primary and the oldest teaching tool across ages: the blackboard or whiteboard. Following the content presentation, students typically engage in exercises, assignments, school projects, and eventually, they undergo assessments. That cycle of learning is the general approach employed. Students usually practice the content through paper-based activities, with limited interactions to other educational tools such as multimedia projector,

computer or tablets. These few interactions with multimedia resources are primarily attributed to the inadequate availability of such resources. For example, at the participant school, there is only one multimedia room for the entire school, which requires prior booking for use. Additionally, the school possesses only tablets as a source of research.

Moreover, tablets are insufficient to accommodate an entire classroom, so students must share them in pairs. Furthermore, not all of the tablets are in proper working condition.

Another issue that is important to consider regarding students' limited exposure to multimedia is related to the willingness from teachers to use technological resources. Some teachers may not feel comfortable with technology, leading them to avoid its use and instead rely on traditional methods such as the blackboard and paper and pen activities.

English classes in public schools often present a complex challenge that teachers must address. Students usually have different proficiency levels of English. Most of them are beginners. However, there are intermediate or upper intermediate students in the same class. Thus, it is necessary to attempt to accommodate the different levels while teaching the target content in class.

Concerning the way that L2 vocabulary is taught to 6th grade students, it is usual to introduce the target vocabulary using visual aids, enabling students to associate L2 words with their meanings. In cases where students enjoy arts, students may be encouraged to create drawings related to the target vocabulary. For instance, if the target vocabulary are animals, they could engage in a game of image and action, in which each student needs to perform the animal that was ruffled. Therefore, these simple and different activities are part of teachers' attempts to expose learners to the target vocabulary as much as possible, in various contexts, aligning with recommendations from the literature (Barcroft *et al*, 2011).

CHAPTER III

3 METHOD

This present chapter is organized into 7 major sections outlining in the details the methodological procedures adopted in the present studies. Section 3.1 presents the objectives, research questions and hypothesis of this research. In section 3.2 the general design is described. Section 3.3 presents information about participants who volunteered for this research. The instruments of data collections are presented in section 3.4. Section 3.5 portrays the general procedures for data collection and section 3.6 presents the description of the intervention period.

3.1 OBJECTIVES, RESEARCH QUESTIONS AND HYPOTHESIS

The main objective of this research was to investigate if a digital game would lead to a higher L2 vocabulary retention compared to classroom activities in a population of 16 young learners of English, who were attending the 6th grade of a public school in the city of São José (SC).

In order to fulfill the main objective of the present study, the following research questions were proposed to be investigated:

1. How do digital games, compared to daily classroom activities, contribute to the learning of L2 (English) vocabulary in the school setting?
2. For Brazilian sixth grade students learning English in the school context, does the use of the *Fast Vocabulary* game lead to higher L2 vocabulary gains than the use of classroom activities?

From these research questions it was generated the following hypotheses:

Compared to learners exposed to daily classroom vocabulary activities, learners exposed to the game *Fast Vocabulary* will be more inclined to retain the target vocabulary due to the central characteristics that the game presents.

As stated in Chapter 1, this hypothesis is related to the characteristics that games have. Butler (2019, p. 1) states that games present features that are central to learning, such as clear goals, feedback, and challenges. In addition, games can be a motivational source for learners and reduce their anxiety (THOMAS, 2012) and these features are important factors to consider in a learning environment. Furthermore, games contain design, songs, images,

letters, phrases, sounds, and rewards which evokes learners' sensory stimulus (RAMOS; LORENSET; PETRI, 2016). This means that by using digital games learners may be more instigated and motivated to learn. Moreover, previous studies (MILLER, HEGELHEIMER, 2006; AGHLARA, TAMJID, 2011; SALAVAT, SALEHI, 2016; MOHSEN EBRAHIMZADEH, 2017; HAO- JAN HOWARD CHEN, HSIAO- LING HSU, 2019) indicate that digital games improve L2 vocabulary learning. However, not all these studies compared classroom activities for learning with digital games, but all of them proposed an investigation regarding L2 vocabulary learning/retention and the use of digital games.

3.2 GENERAL RESEARCH DESIGN

In order to test the hypothesis previously mentioned, the present study was conducted in three phases, as follows:

1. Phase 1: demographic questionnaire and pre-tests.
2. Phase 2: treatment consisting in exposing L2 target vocabulary to participants about food,
3. Phase 3: post-tests.

3.3 PARTICIPANTS

The present study was approved by the Ethics Committee of the Universidade Federal de Santa Catarina (CAAE: 61944222.7.0000.0121).

The investigation was conducted at a public school in the city of São José, state of Santa Catarina. It involved an experimental group and a control group, each consisting of 8 participants. The selection of participants for the experimental and control group was done randomly. All participants were currently attending the 6th grade at the time of data collection.

The experimental group presented 8 native speakers of Brazilian Portuguese, consisting of 4 girls and 4 boys, with ages ranging from 11 to 15 years ($M= 12$). As assessed by the Vocabulary Levels Test (Nation, 1983, 2001), 7 participants demonstrated a low level English proficiency, while 1 participant presented a high level of English proficiency, with 75% of the test corrected accurately. In the control group, 7 participants were native speakers of Brazilian Portuguese, and one participant was a native speaker of Venezuelan Spanish. The control group consisted of 4 girls and 4 boys, with ages varying from 11 to 15 years ($M= 12$,

37). According to the Vocabulary Levels Test (Nation, 1983, 2001), 5 participants had low proficiency in English, and 2 presented an intermediate proficiency in English. In the sequence, participants' parents signed a consent form authorizing their children to participate in the study. The children themselves signed an assent form. In order to be included in this study participants should be attending the 6th grade of a public school. A public school was chosen mainly because I wanted my research context to be as close to that I had experience in as possible. The 6th grade was chosen because it is the first year, in state-run schools, that participants have regular English classes as a curriculum subject, thus being more systematically exposed to explicit L2 English vocabulary knowledge.

3.4 INSTRUMENTS

Nine instruments were used in this research: (1) a questionnaire to collect personal information and linguistic background information from participants before the period of intervention (Appendix A); (2) a Pretest of Word Recognition (Appendix B); (3) Pretest of Picture Matching (Appendix C); (4) a Pretest of Translation (Appendix D); (5) The Vocabulary Levels Test (Appendix E). These instruments were applied before the intervention period.

Following the intervention period, in which participants were exposed to target vocabulary either through the use of digital game or through daily classroom activities, the following instruments were used: (6) a Post-test of Picture Matching (Appendix F); (7) a Post-test of Translation (Appendix G). Considering the treatment period, the instruments used during this phase were: (8) paper and pencil vocabulary activities (Appendix H, I, J and K); (9) The game Fast Vocabulary (Appendix L). Instrument eight (8) was applied to the control group, while instrument nine (9) was applied to the experimental group.

(1) It is important to highlight that instruments 2 to 7 were adapted from SOUZA (2015) who investigated L2 vocabulary learning and working memory in young learners. These instruments are: the Word Recognition test, the Picture Matching test, the Translation test and the Vocabulary Levels Test (VLT), translated by Souza (2015). Each instrument will now be described in detail.

(1) Questionnaire for personal information and linguistic background: This questionnaire was composed of 14 questions, all of them were in Portuguese. The purpose of the questions was to understand how many languages the participants spoke, as well as which language they were proficient in. In addition, there were questions to understand their exposure to

English as L2. Specifically, there were questions regarding whether they received English classes through private courses. In addition, the questionnaire explored questions about their gaming habits, including the types of games they enjoyed and the amount of time they typically spent playing games each day.

(2) Pretest of Word Recognition: This pretest (Appendix B) was developed by Souza (2015) at the Laboratório de Linguagem e Processos Cognitivos (Labling) from Universidade Federal de Santa Catarina. This test aims at verifying participants' knowledge regarding words in Portuguese. In this test, there are 40 images related to the theme "food" in which participants are requested to write their corresponding names. This test was applied at the beginning of the experiment to both groups. Using this pre-test, it was possible to verify if the words selected for the pre-test of Picture Matching and the pretest of Translation were already part of their vocabulary in Portuguese.

The same images and words were used in these 3 pre-tests: Word Recognition test, Picture Matching test and Translation test, so, always a series of 40 stimuli was presented in the tests.

(3) Pretest of Picture Matching: This pretest (Appendix C) was developed by Souza (2015) at Laboratório de Linguagem e Processos Cognitivos (Labling) from Universidade Federal de Santa Catarina and was applied to assess participant's vocabulary knowledge in their L2 (English). The test was about the theme "food". In this test, it was possible to notice which words were already familiar to participants. It was a multiple-choice test in which participants should relate the images with the corresponding words.

(4) Pretest of Translation: This test consisted of 40 words supposedly unknown in the L2 to be translated into Portuguese. The theme of the target words were "food". (Appendix D).

The criteria for words choices for the pretests of Picture Matching and Translation test were: each word should have one main translation equivalent in Portuguese which was unambiguous; the word should be concrete, referring to a type of food.

(5) Pretest of Vocabulary Levels Test (VLT): The Vocabulary Levels test was originally designed by Nation (1983) and revised by Schmitt et al (2001). It was also translated by Souza (2015) to measure learners' current knowledge of written receptive vocabulary in English. Hence, this test was applied to evaluate participants' current level of their L2 vocabulary knowledge. Based on Souza's research (2015) and Nations' instructions (2004): three levels of words were chosen for this test. The second level of words (containing 1000 words), the third level of words (containing 1000 words), and the fifth level of words (containing 1000 words). The second level encompasses the second 1000 word families more

frequent in English. The third level contains the third family of words more frequent in English and so on (Appendix E).

(6) Post-test of Picture Matching: This post-test was designed in the same format used in the pretest of Picture Matching. This post-test consisted of measuring L2 vocabulary knowledge about food at the end of the instructional phase. This post-test was applied immediately after the period of intervention for both groups (Appendix F).

(7) Post-test of Translation: This post-test contained the same 40 words used in the pre-test of Translation. Participants should translate 40 words in English to Portuguese, their L1. This test was immediately applied after the period of intervention and it consisted of verifying participants' written receptive vocabulary knowledge (Appendix G).

(8) Classroom activities: These activities consisted of practicing the main elements that are fundamental to stimulate vocabulary learning. Hence, there were activities in which the objective was to note the words. Furthermore, there were activities to exercise the retrieval of the words since words need to be noticed and retrieved/remembered constantly to be learned (BARCROFT et al, 2011. p 573). The activities are described in the following section "4.4 intervention period" (see Appendix H, I, J and K). Also, the activities were already applied in a previous study about L2 vocabulary learning and working memory (SOUZA, 2015).

(9) Fast Vocabulary: The game Fast Vocabulary is a freely available game created by Dwyer (2010) composed of an extensive vocabulary in English. There is vocabulary concerning clothes, food, colors, animals, objects of the house, professions, human body, personal objects, electronic objects, sports, nature, countries, etc.

The game presents a revision part in which players see an image referring to the vocabulary, followed by words' pronunciation. The revision part can be done as much as the player wants. Hence, the game first presents the target words and teaches them. After the revision period, players can start the game. The objective of the game is to teach words in English and their meaning through rounds of associations of words with images.

The game mechanism is through rounds. In the first round, the player would see three words and three images and combine them. When the matching was done correctly, it was possible to listen to the words' pronunciation. In the following round, the game presented one image and three words, in this sense, only one word could be the possible choice. Each moment that the matching was done correctly it was possible to listen to the words' pronunciation. In the next section, three images and three words appeared, the schema about matching and pronunciation remained.. In the fourth round, there were 4 images and 4 words to be combined. In sequence, one image and 3 words appeared, and, in this way, the rounds

were presented. However, when the matching was incorrect, the game “erased” the wrong possibility, promoting instantaneous feedback.

During the rounds, which vary constantly, the words are presented more than once. Thereby, the words’ frequency is highly appreciated during the game. This increases the possibility of retention of the words (BARCROFT et al, 2011. p 573). In this way, it is expected that the game enhances learning concerning the target words due to word’s frequency.

The challenge of the game is related to the time of response and scores. The faster and correct the answer is, the higher will be players’ scores. However, if the player’s matches are incorrect, their scores decrease. At the end of the game, as a reward a list with scores worldwide is available, thereby, players can analyze their place and can see from which countries this game is played (Appendix L).

3.5 DATA COLLECTION PROCEDURES

First, the present research was approved in a pre-qualifying session as part of PPGI/UFSC requirements in the MA program. The project was previously sent to two schools to be analyzed by the area of research in English. The schools were available and conceded a letter of consent authorizing the data collection. It is important to state that there was no connection between the researchers, the school, and the English teacher of the 6th-grade class.

After the approval of the research at CEPESH/UFSC, the data collection process began. First, the pilot study was conducted. After adjustments based on the pilot study, the main data collection started. The intervention process consisted of L2 vocabulary exposure through the game Fast Vocabulary (to the experimental group) and the L2 vocabulary exposure through classroom activities (to the control group). In the end, immediate post-tests were applied. The research was conducted in person and participants were exposed to the same target vocabulary.

After participants indicated their interest in participating in the research, their legal guardians received the Termo de Consentimento Livre e Esclarecido (TCLE- Appendix M). After the guardians’ authorization, the participants received the Termo de Assentimento Livre e Esclarecido (TALE- Appendix N). Participants, then, were given the questionnaire for personal information and linguistic background (Appendix A).

For the data collection phase, participants were randomly divided between the experimental group, which was exposed to the L2 vocabulary through the game Fast Vocabulary, and the control group which was exposed to L2 vocabulary through activities without the game. Both groups did the same tests presented in the previous section. The data collection included a pilot study, in which 2 students were assigned to a control group, and 2 students to an experimental group, randomly. The objective to have a pilot study was to evaluate if the instruments, materials, and procedures of the research were suitable. After adjustments, the data collection began.

3.6 INTERVENTION PERIOD

Before starting the intervention, the researcher explained all procedures to participants, emphasizing which tasks participants would perform and indicating that participants could give up participating in the study at any moment. The intervention took place at the school where the study was being carried out.

After the period of pretests, the instruction period for the experimental group consisted of 2 group meetings of 15 minutes. During this period, participants were exposed to the target words through the game Fast Vocabulary. The exposure took place in the school's multimedia room, and they played the game using the school's tablets. During this period, one colleague from LabLing and I were assisting participants in case of any doubt and to ensure they were actively engaged in playing the game. They did not demonstrate doubts or difficulties to understand the objective of the game.

Regarding the control group, participants were exposed to the same target words presented to the experimental group (category: food), and for the same amount of time (total of 2 meetings of 15 minutes). The exposure took place in the school's multimedia room where the target words were presented through a PowerPoint presentation, and participants engaged in the classroom individually. Feedback was provided when participants concluded the activities.

There were 4 activities, all of them previously used in Souza (2015). The objective of the first activity was to enhance the possibility of the target word in the L2 being noticed. In this activity, a food pyramid was presented and participants needed to observe the distribution of the food in the pyramid (Appendix H).

In the second activity, the focus was to note the target words in the L2. Hence, participants should relate the images with the corresponding food (appendix I). In the third activity, the focus was to remember the word. Participants received a sheet of paper with images of food distributed on one side. On the other side, there was a space for them to write the foods' names. This means that they should analyze which food appears in the sheet and write the respective name according to its classification. For example: Mangoes (fruit) (Appendix J).

In the fourth activity, a bingo game was played. Each participant received one bingo card with food images. The researcher raffled the food names and made them available in a PowerPoint presentation. Participants would write the food's names below the image in their cards. The participant needed to complete one card to win the game (Appendix K).

Concerning feedback, the experimental group received it constantly during the game, while the control group received it at the end of each activity. Participants from the control group celebrated when they got the correct answer, whereas the experimental group expressed dissatisfaction if they incorrectly matched the word and the image in the game. And, if they matched correctly, they would simply continue playing.

After the intervention period, the immediate post-tests were applied to both groups. Regarding the data storage, they were stored in an electronic device to assure the confidentiality of information and participants' privacy of this research. The data referring to each participant was codified in alphanumeric form (E.G., Participant A1, B1, C1, etc).

CHAPTER IV

4 RESULTS AND DISCUSSIONS

The main goal of the present chapter is to present the results of the study as well as readdress the research questions, in order to investigate if a digital game would lead to a higher L2 vocabulary retention compared to classroom activities. To reach this objective, I collected data from a population of 16 young learners attending the 6th grade at a public school in the city of São José (SC).

This chapter is organized into 3 sections. Section 4.1 provides the descriptive analysis of the results. Section 4.2 presents the inferential analysis of the results. Finally, section 4.3 readdresses the research questions.

4.1 DESCRIPTIVE ANALYZES

For the purposes of the present study, the data were analyzed in a linear mixed effect model. There were 64 observations collected from 16 participants who performed 4 tests. These tests were a pretest of Word Recognition, pretest of Picture Matching, pretest of Translation and pretest of Vocabulary Levels Tests. In order to answer the research questions, I analyzed the scores of the tests as fixed factors and participants as random factors. The participants were divided into 2 groups, the experimental and control group.

All data analyses were conducted using software Rstudio 4.3.0. and the packages used were lme4 (Bates et al, 2015); lmetest (Kuznetsova et al,2017) and ggplot (Wickham, 2016). The significance level of the statistical tests was 95%.

The results in Table 1 show the mean scores of the tests by group and type of test.

Table 1. Mean and standard deviation by tests and groups

Tests	Group	Mean	Sd
PostTeste_PM	Control	24	11.4
PostTest_PM	Experimental	25.9	8.97
PostTest_TR	Control	27.2	6.23
PostTest_TR	Experimental	33.1	4.79

PreTest_PM	Control	16.1	9.28
PreTest_PM	Experimental	26.8	9.38
PreTest_TR	Control	18	6.85
PreTest_TR	Experimental	34	4.60

Note: PostTest_PM= Post-test of Picture Matchin; PostTest_TR= Post-Test of Translation; PreTest_TR= Pretest of Translation; PreTest_PM= Pretest of Picture Matching.

The Mean and Standard Deviation of the participants' scores of the tests are presented in Table 1. The data indicates that, in the experimental group, the mean score for the picture matching pretest was 26, and for the pretest of translation, it was 34 (the maximum score in these tests should be 40). These findings suggest that the experimental group already possessed prior knowledge of the target words in the L2. In contrast, the control group had a mean score of 16.1 for the picture matching pretest and 18 for the translation pretest (both maximum scores in these tests should be 40). These results indicate that the control group had an inferior prior knowledge of the target words in English. Therefore, the higher mean observed in the experimental group suggests that their prior knowledge of the target words in the L2 was superior compared to the control group.

During the post-tests, the experimental group achieved a mean score of 25.9 in the picture matching test and 33.1 in the translation post-test (both maximum scores should be 40). These results indicate that the experimental group demonstrated a lower performance during the post-tests, despite their higher level of prior knowledge shown in the pretests.

On the other hand, the control group achieved a mean score of 24 in post-test of picture-matching and a mean score of 27.2 in post-test of translation (both maximum scores in these tests should be 40). These findings suggest that the control group presented an improved performance compared to their previous scores in the pretests. However, their knowledge of L2 vocabulary still remained lower compared to the experimental group. Thus, although the control group retained L2 vocabulary words, their performance was still below compared to the experimental group.

As can be seen in Figure 1, the experimental group presented higher mean scores compared to the control group across all tests, implying that the experimental group presented a higher level of knowledge regarding the target words exposed in this study.

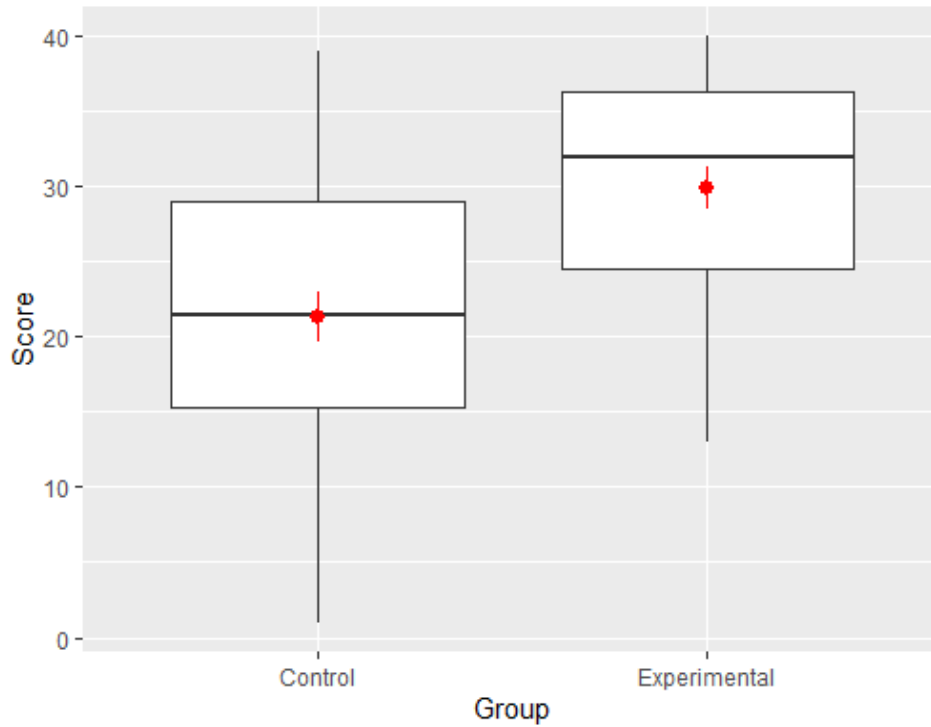


Figure 1. Boxplot by groups

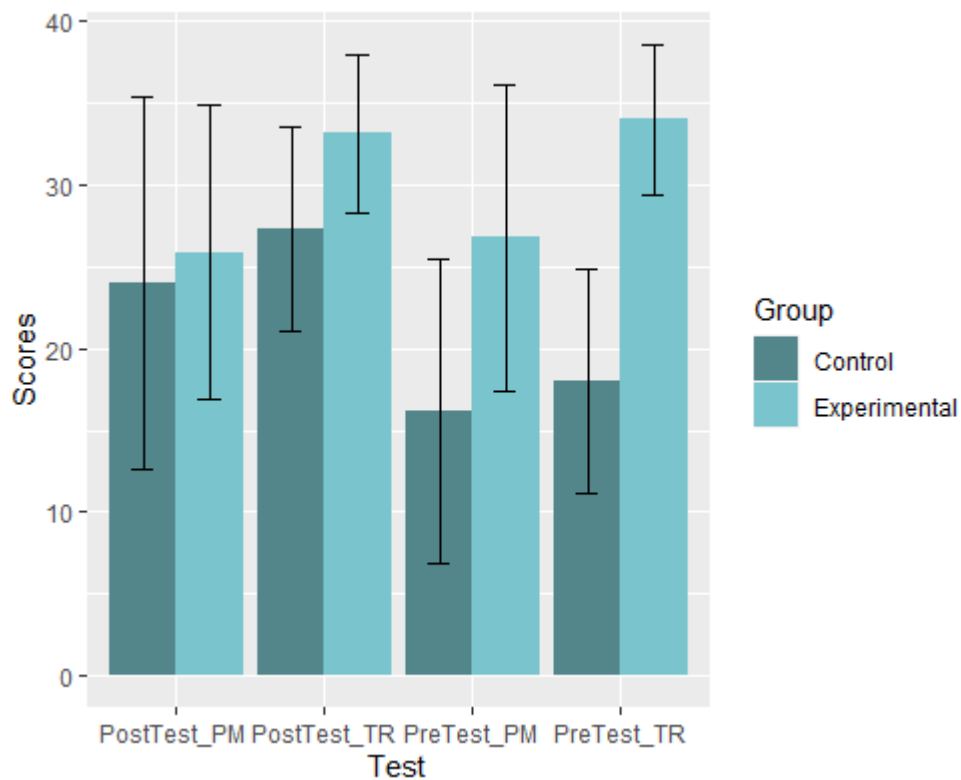


Figure 2. Bar plot per groups and tests

Figure 2 shows the performance of both groups in the tests. The mean score of the pretest of picture matching (PM) for the control group was lower than for the experimental

group. In the posttest of picture matching (PM), the mean score for the control group was still lower than for the experimental group. However, the mean score of the pre- and posttests of the control group changed, meaning that, the control group enhanced its performance in this test.

The experimental group outperformed the control group during the pretest of picture matching, suggesting that participants from the experimental group had a higher L2 vocabulary knowledge compared to the control group before the intervention. Similarly, this trend was observed during the pretest of translation, although the scores were lower than the picture matching scores for the experimental group. In other words, before the intervention, the experimental group had better scores than the control group in picture matching and translation, which means that the groups were not homogeneous in terms of their knowledge of vocabulary prior to the intervention.

Considering the post-tests, the difference between the control and experimental group performance in picture matching was not as evident since the experimental group was only slightly superior to the control group in the picture matching test. However, during the post-test of translation, the experimental group clearly outperformed the control group.

It is important to note that the experimental group exhibited poorer performance in the post-test of translation compared to their pre-test performance. This pattern also appeared in the picture matching test, suggesting that students may have been fatigued and had difficulty maintaining focus and concentration during the tests.

On the other hand, the control group demonstrated improved performance when compared to their own previous performance.

4.2 THE INFERENTIAL ANALYSES

A linear mixed effect model was conducted to assess if the scores of the participants in the posttests significantly increased in comparison to the pretests. The scores of the tests were the fixed factors and the participants were the random factors.

Table 2 presents the summary of the model fitted by group and tests.

Table 2. Inferential analysis of participants' scores by group and tests

	Estimate Std	Error	Df	t value	Pr (> t)
--	--------------	-------	----	---------	-----------

(Intercept)	24.000	2.85	18.94	8.46	7.35e-08 ***
PostTest_TR	3.250	1.17	42.00	1.84	0.07170 .
PreTest_PM	-7.87	1.79	42.00	-4.47	5.70e-05 ***
PreTest_TR	-6.00	1.75	42.00	-3.41	0.00144 **
GroupExperimental	1.87	4.01	18.94	0.46	0.64
PostTest_TR(GE)	4.00	2.48	42.00	1.60	0.11
PreTest_PM (GE)	8.75	2.48	42.00	3.51	0.00106 **
PreTest_TR(GE)	14.12	2.48	42.00	5.67	1.15e-06 ***

According to Table 2, the results show a significant main effect in the posttest of Picture Matching ($\beta = 24.00$, $t = 8.46$, $p < .01$), in the pretest of Picture Matching ($\beta = -7.87$, $t = -4.47$, $p < .01$), and in the pretest of Translation ($\beta = -6.00$, $t = -3.41$, $p < .01$) for the control group. It seems that, within the control group, there was a significant difference between the pretest and posttest of Picture Matching. This means that, specifically in these tests, the participants were able to retain the L2 vocabulary target words which they were exposed to during the intervention.

Additionally, the results show a significant interaction in the pretest of Picture Matching ($\beta = 8.75$, $t = 3.51$, $p < .01$) and in the pretest of Translation ($\beta = 14.12$, $t = 5.67$, $p < .01$) for the experimental group. However, there was no statistically significant effect within the experimental group. It seems that the participants of this group were not able to retain the L2 vocabulary target words which they were exposed to during the intervention.

Regarding the comparison between groups, there was no significant effect ($\beta = 1.87$, $t = 0.46$, $p > .01$). The hypothesis of the present study was that, compared to learners exposed to daily classroom vocabulary activities, learners exposed to the game Fast Vocabulary would be more inclined to retain the target vocabulary due to the central characteristics that the game presents. The results of the statistical analyses show that this hypothesis was not confirmed.

4.3 READDRESSING THE RESEARCH QUESTION

The main goal of this section is to readdress the research questions pursued in the present study.

Research question 1: How do digital games, compared to daily classroom activities, contribute to the learning of L2 (English) vocabulary in the school setting?

The learning outcomes did not align with the initial expectations. The experimental group exhibited did not show improvement, between pre- and post tests, in L2 vocabulary retention. In contrast, the control group demonstrated significant improvement in L2 vocabulary retention in the Picture Matching test. These findings suggest that, for the participants of the present study, traditional instruction, involving teaching L2 target words and providing practice of exercises was a more effective approach than using a digital game. It seems that relying solely on a game may not be enough to foster L2 vocabulary retention.

Research Question 2: For Brazilian sixth grade students learning English in the school context, does the use of the Fast Vocabulary game lead to higher L2 vocabulary gains than the use of classroom activities?

Hypothesis 1: Compared to learners exposed to daily classroom vocabulary activities, learners exposed to the game Fast Vocabulary will be more inclined to retain the target vocabulary due to the central characteristics that the game presents, such as setting clear goals, providing challenges and feedback, and the frequency with which target words are presented.

Hypothesis 1 was not supported by the results of the present study. No statistically significant differences were found between the groups in the post-tests. Several possible explanations can be considered. First, digital games may not possess the same level of instructional efficacy as a traditional classroom setting with a teacher and interactive activities. Second, the chosen game, Fast Vocabulary, and its specific format, might not be the most suitable approach for effectively teaching L2 vocabulary to young learners. Third, it is worth noticing that the experimental group already exhibited a high level of proficiency in L2 vocabulary compared to the control group, in the pretests. This suggests that the game and, possibly, the target words, were not instrumental enough in leading to the expansion of these participants' vocabulary. This may have affected, for instance, their motivation to perform the post-tests.

To conclude, these findings did not present results similar to what the literature already suggests.

CHAPTER V

5 FINAL REMARKS

The main objective of this study was to investigate if a digital game would lead to higher L2 vocabulary learning when compared to classroom activities. To pursue this objective, I collected data from 16 young learners of English at a public school in the city of São José, Santa Catarina.

The hypothesis formulated in this study was that the experimental group would outperform the control group. This hypothesis was primarily based on the positive attributes that digital games present, such as their ability to provide instantaneous feedback, challenges and rewards, as well as the frequency of words within the game, an essential characteristic to retain a word in L2. In order to obtain the results, the study was designed into three phases: pretests, an intervention phase where the experimental group was exposed to the L2 target words through the game Fast Vocabulary, while the control group was exposed to classroom activities. Finally, the immediate post-tests were applied for both groups.

The most significant finding of the present study is the lack of significant statistical difference between the groups. Consequently, based on these results, it is not possible to assert that a digital game such as Fast Vocabulary leads to higher L2 vocabulary retention when compared to regular classroom activities. In addition, the improvement of the control group, after the intervention with daily classroom activities suggests that selecting a digital game with the intention of replacing traditional classroom activities and exercises may not be the ideal strategy for L2 vocabulary learning with 6 th graders.

Next, I will discuss the limitations and suggestions for future studies.

5.2 LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The main goal of the present study was to investigate whether a digital game could enhance L2 vocabulary retention compared to classroom activities. Although the study was methodologically and theoretically guided by relevant literature, there were some limitations that future studies should take into consideration.

Firstly, a limitation of the present study was the relatively small number of participants. Therefore, further research should consider including a larger sample size to exhibit more statistically significant results.

Secondly, the participants in this study were 6th-grade students from a public school. However, the study did not exclude participants who had prior exposure to the English language, such as those who had taken private courses, nor did it exclude participants whose mother language was Spanish. The decision to retain the data of these participants was made to avoid reducing the sample size. However, further research should explore groups comprising native Brazilian speakers, native Spanish speakers (given the attendance of Spanish-speaking students at public schools in Brazil), and participants without any formal English language training. This approach would ensure that the target vocabulary remains unfamiliar to participants, establishing a more accurate assessment.

Finally, it is worth noting that the choice of the game used in the study may not have been optimal. Therefore, further investigations should consider using both educational games and commercial games. Educational games are specifically designed for learning purposes but often lack an engaging and enjoyable experience that captures children's attention and fosters a state of flow. On the other hand, commercial games can fully immerse players in a virtual world but may not effectively teach targeted content. Consequently, examining these two types of games in comparison to classroom activities would be valuable, as it could shed more light on this topic.

5.3 PEDAGOGICAL IMPLICATIONS

The results of the present study offer some pedagogical implications.

Firstly, the hypothesis that was not confirmed in this study provides an alternative perspective on the context of L2 teaching and learning in Brazil. Despite the criticism surrounding traditional teaching methods, which often follow a cyclical pattern of content presentation, explanation by the teacher, students' activities, and subsequent tests to assess learning, the present results suggest a contrasting view. In the case of this particular population, it demonstrated that participants in the control group, exposed to regular classroom activities, exhibited greater improvement when compared to their own pre-tests. On the other hand, such effects were not observed in the experimental group.

This finding can be viewed as both relieving and reflective of the reality of public schools in Brazil. These schools often lack technological resources, and teachers face significant workload constraints that limit their ability to incorporate diverse methods and activities. Nevertheless, the study informs that teaching methods employed in public schools

are not necessarily flawed. Teachers are performing their duties, and students are indeed learning, despite the limitations inherent to the Brazilian educational context.

5.4 PERSONAL EXPERIENCE DURING DATA COLLECTION

In this section I briefly report my personal experience and impressions about the data collection to acknowledge future researchers from unpredicted situations that may occur. Moreover, I describe how participants interacted during the phases of this research.

The data collection took around three months. Students first answered a language experience and demographic questionnaire. During this initial phase they did not present doubts and finished this first task properly.

During the first pre-tests, they were excited, and informed me they would like to answer all answers adequately. Hence, they complained that they had not learned the target content yet, but they would get everything correct if the content were school supplies.

As the purpose of the pre-test was to verify if the target words were known before the intervention began, students appeared worried because they could not be sure about their answers. Thus, I explained that this was part of the research. They did not need to worry since this was to test my “ideas” (hypotheses). I explained to them that they could try their best, but there was no problem in leaving some questions unanswered.

During the intervention period participants from the experimental group who played the game *Fast Vocabulary* did not demonstrate any doubts. Also, some students were very competitive. Some of them got first place worldwide. Some students would always repeat the pronunciation out loud after listening to the game’s pronunciation.

Regarding the control group, during the intervention period, they were participative in class. This group seemed to enjoy being part of my experiment. Concerning the exposition of the target vocabulary, all of them repeated after me the target words. During the activities they did not present many doubts, and they answered all of them correctly.

During the post-test phase they realized they were doing the same tests from the pre-test phase. Thus, they “discovered” that this post-test phase was a moment to verify how many words they would remember after playing or doing the paper and pen activities. However, it is important to mention that during the post-test some of them were demonstrating tiredness, boredom and being less patient to conclude the tests.

In addition, I faced some challenges during the data collection. There were days that the internet connection was not working. Hence, I had to turn my cell phone as a source to the internet connection to the school's tablets. Moreover, as my data collection was once per week, I lost three weeks of data collection because students were absent. First, there was a week that a tragedy happened at a kindergarten in the South of Brazil. Therefore, most of the students stayed at home. Then, there was a rumor that another attack would happen at schools. The third week of data collection did not occur because teachers were doing the month's final tests. Hence, teachers could not allow students to leave the classes.

Thus, I would like to give future researchers some advice about collecting data at schools, mainly, public schools. Be prepared to adapt, as I had to concerning the internet connection. Also, extra dates should be included in your schedule in case of absent students or week of exams, for example.

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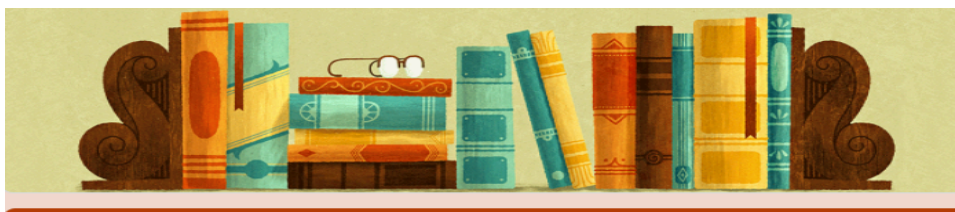
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7. APPENDIX

Appendix A – Demographic Questionnaire

This document can be found at this link:
<https://docs.google.com/forms/d/16WUNVqL2yAOeltQL76Raa7vIrokyeBTT10ocFmxwE8w/edit?usp=sharing>



Questionário Demográfico

UNIVERSIDADE FEDERAL DE SANTA CATARINA
 CENTRO DE COMUNICAÇÃO E EXPRESSÃO
 PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS
 LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS
 ESTUDANTE: RAYLA ROCHA DOS SANTOS
 ORIENTADORA: MAILCE BORGES MOTA

Olá, esse é um questionário para sabermos mais sobre você e seu contato com a língua inglesa!

Pedimos para que você informe seu e-mail, assim uma cópia com as suas respostas será enviada a você!

1- Por favor, informe seu e-mail (se você não tiver e-mail, você pode colocar o do seu responsável).

Sua resposta

2- Por favor, informe seu nome completo.

Sua resposta

Appendix B- Pre-test of word recognition

Based on Souza (2015).

Universidade Federal de Santa Catarina

Laboratório da Linguagem e Processos Cognitivos

Atividade de Vocabulário - Reconhecimento de palavras

Data: __/__/__

Código do participante: ____

Turma: _____

Instrução: Escreva em português o nome das figuras:















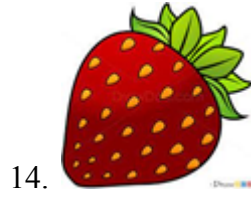


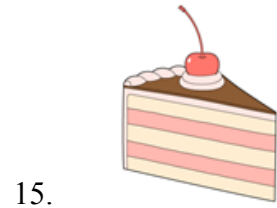














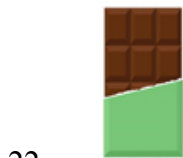




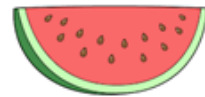


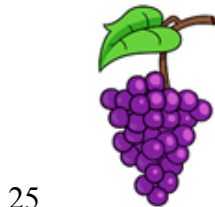












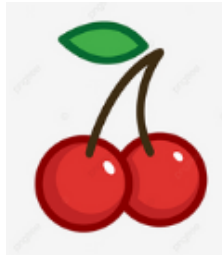




28.



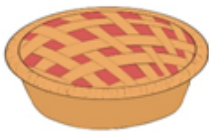
29.



30.



31.



32.



33.



34.



35.



36.



37.



38.



39.



40.



Appendix C - Tarefa 2- Pareamento de Figuras

Baseado em SOUZA, 2015.










Universidade Federal de Santa Catarina
Laboratório da Linguagem e Processos Cognitivos

Atividade de Vocabulário - Pareamento de figuras

Data: ____/____/____

Código do Participante: _____ Turma: _____

Instrução: Escreva a alternativa que corresponde à figura:

- | | | |
|--|--|--|
| 1.  | 2.  | 3.  |
| <input type="checkbox"/> Pie | <input type="checkbox"/> Cucumber | <input type="checkbox"/> Watermelon |
| 4.  | 5.  | 6.  |
| <input type="checkbox"/> Honey | <input type="checkbox"/> Lemonade | <input type="checkbox"/> Cake |
| 7.  | 8.  | 9.  |
| <input type="checkbox"/> Peas | <input type="checkbox"/> Garlic | <input type="checkbox"/> Milk |



10.

 Lollipop

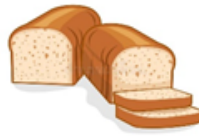
11.

 Avocado

12.

 Donuts

13.

 Cereal

14.

 Pasta

15.

 Candy

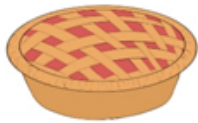
16.

 Water

17.

 Mango

18.

 Fish

19.

 Cake

20.

 Strawberry

21.

 Butter

22.

 Onion

23.

 Grape

24.

 Meat



25. Chocolate



26. Cauliflower



27. Corn



28. Cherry



29. Coffee



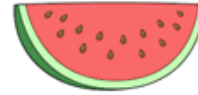
30. Pancakes



31. Tomato



32. Broccoli



33. Cheese



34. Peppers



35. Bread



36. Apple



37. Pumpkin



38. Carrot



39. Chicken



40.

()Egg

Appendix D - Teste de tradução**Universidade Federal de Santa Catarina****Atividade – Tradução de Vocabulário**

Data: __/__/__

Código do participante: _____

Turma: _____

Instrução: Traduza as seguintes palavras para o português:

1- Grape: _____

2- Butter: _____

3- Carrot: _____

4- Peas: _____

5- Bread: _____

6- Water: _____

7- Broccoli: _____

8- Cucumber: _____

9- Corn: _____

10- Strawberry: _____

11- Watermelon: _____

12- Cake: _____

13- Lollipop: _____

14- Apple: _____

15- Cauliflower: _____

16- Pumpkin: _____

17- Candy: _____

18- Chocolate: _____

- 19- Pineapple: _____
20- Pie: _____
21- Pepper: _____
21- Pancake: _____
23- Cherry: _____
24- Coffee: _____
25- Garlic: _____
26-Honey: _____
27- Egg: _____
28- Tomato: _____
39- Mango: _____
30- Beef: _____
31-Chicken: _____
32- Milk: _____
33- Donuts: _____
34- Cheese: _____
35- pasta: _____
36- Fish: _____
37- Onion: _____
38- Avocado: _____
39- Lemonade: _____
40- Cereal: _____

Appendix E - Teste de vocabulário

Tarefa de vocabulário - Vocabulary Levels Test (VLT)

Universidade Federal de Santa Catarina

Traduzido por Souza (2015).

Atividade de Conhecimento de Vocabulário

Data: ___/___/_____

Código do Participante: _____

Turma: _____

Atividade de Níveis em vocabulário: Versão 1

Esta é uma atividade de vocabulário. Escolha a palavra certa para cada significado. Escreva o número da palavra na linha do significado correspondente. Como no exemplo abaixo:

1- Business

2- Clock

_____ uma parte da casa

3-Horse

_____ um animal com quatro patas

4-Pencil

_____ Algo usado para escrever

5- Shoe

6- Wall

Você pode escrever da seguinte maneira:

1- Business

2- Clock

6 Uma parte da casa

3-Horse

3 Um animal com quatro patas

4-Pencil

4 Algo usado para escrever

5- Shoe

6- Wall

Algumas palavras estão no teste para aumentar o desafio. Você não precisa encontrar um significado para as outras palavras. No exemplo acima, as palavras do desafio são business, clock, shoe. Tente fazer todas as partes da atividade!

Versão 1- Nível das 2.000 palavras

1 birth

2 dust _____ jogo

3 operation _____ ganhar

4 row _____ nascer

5 sport

6 victory

1 choice

2 crop _____ calor, frio

3 flesh _____ carne

4 salary _____ dinheiro pago regularmente por um trabalho feito

5 secret

6 temperature

1 cap

2 education _____ ensinar e aprender

3 journey _____ números usados para medir algo

4 parent _____ ir a um lugar distante

5 scale

6 trick

1 attack

2 charm _____ ouro e prata

3 lack _____ qualidade atraente

4 pen _____ não ter algo

5 shadow

6 treasure

1 cream

2 factory _____ parte do leite integral

3 nail _____ muito dinheiro

4 pupil _____ uma pessoa que estuda

5 sacrifice

6 wealth

1 adopt

2 climb _____ subir

3 examine _____ olhar de perto

4 pour _____ estar por todos os lados

5 satisfy

6 surround

1 bake

2 connect _____ juntar, unir

3 inquire _____ andar sem rumo

4 limit _____ manter algo em certo tamanho

5 recognize

6 wander

1 burst

2 concern _____ estourar

3 deliver _____ melhorar

4 fold _____ levar algo a alguém

5 improve

6 urge

1 original

2 private _____ primeiro

3 royal _____ não é público

4 slow _____ tudo somado

5 sorry

6 total

1 brave

2 electric _____ feito costumeiramente

3 firm _____ querer comida

4 hungry _____ não ter medo

5 local

6 usual

Versão 1 - Nível das 3.000 palavras

1 belt

2 climate _____ ideia

3 executive _____ parte de dentro da mão

4 notion _____ faixa de couro usada na cintura

5 palm

6 victim

1 acid

2 bishop _____ sensação de frio

3 chill _____ animal de fazenda 126

4 ox _____ organização

5 ridge

6 structure

1 bench

2 charity _____ assento longo

3 jar _____ ajuda aos necessitados

4 mate _____ parte de um país

5 mirror

6 province

1 boot

- 2 device _____ oficial militar
3 lieutenant _____ um tipo de rocha
4 marble _____ tubo por onde o sangue flui
5 phrase
6 vein

- 1 apartment
2 candle _____ um lugar para morar
3 draft _____ chances de algo acontecer
4 horror _____ primeira versão de algo escrito
5 prospect
6 timber

- 1 betray
2 dispose _____ assustar
3 embrace _____ dizer publicamente
4 injure _____ machucar seriamente
5 proclaim
6 scare

- 1 encounter
2 illustrate _____ encontrar
3 inspire _____ implorar por ajuda
4 plead _____ fechar completamente

5 seal

6 shift

1 assist

2 bother _____ ajudar

3 condemn _____ cortar com precisão

4 erect _____ girar rapidamente

5 trim

6 whirl

1 annual

2 concealed _____ selvagem

3 definite _____ claro e preciso

4 mental _____ acontece uma vez ao ano

5 previous

6 savage

1 dim

2 junior _____ estranho

3 magnificent _____ maravilhoso

4 maternal _____ com pouca iluminação

5 odd

6 weary

Versão 1 Nível das 5.000 palavras

1 balloon

2 federation _____ balde

3 novelty _____ coisa incomum e interessante

4 pail _____ saco de borracha cheio de ar

5 veteran

6 ward

1 alcohol

2 apron _____ etapa de desenvolvimento

3 hip _____ estado de sujeira e desorganização

4 lure
roupas _____ peça usada na frente do corpo para proteger suas

5 mess

6 phase

1 apparatus

2 compliment _____ expressão de admiração

3 ledge _____ instrumentos ou maquinário

4 revenue _____ dinheiro recebido por um governo

5 scrap

6 tile

1 bulb

2 document _____ cavalo fêmea

3 legion _____ grande grupo de soldados ou pessoas

4 mare _____ um pedaço de papel contendo informações

5 pulse

6 tub

1 concrete

2 era _____ forma circular

3 fibre _____ topo de uma montanha

4 loop _____ um longo período de tempo

5 plank

6 summit

1 blend

2 devise _____ misturar

3 hug _____ planejar ou inventar

4 lease _____ abraçar

5 plague

6 reject

1 abolish

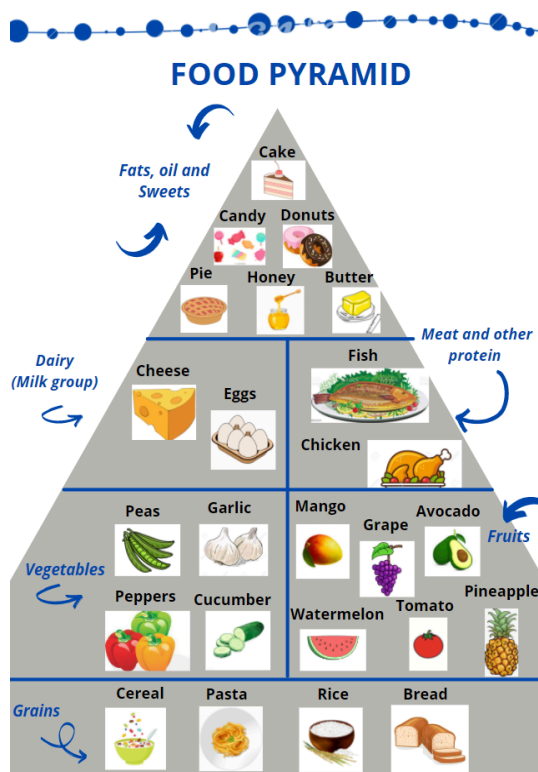
2 drip _____ terminar algo com uma lei

3 insert _____ adivinhar o futuro

- 4 predict _____ acalmar ou reconfortar alguém
- 5 soothe
- 6 thrive
-
- 1 bleed
- 2 collapse _____ vir antes
- 3 precede _____ cair de repente
- 4 reject _____ mover-se com passos ou saltos rápidos
- 5 skip
- 6 tease
-
- 1 casual
- 2 desolate _____ com cheiro forte
- 3 fragrant _____ único
- 4 radical _____ bom para a saúde
- 5 unique
- 6 wholesome
-
- 1 gloomy
- 2 gross _____ vazio
- 3 infinite _____ sombrio, triste
- 4 limp _____ sem fim
- 5 slim
- 6 vacant

Appendix F- Activity 1- To notice words through a food pyramid

(Adapted from Souza, 2015).



Appendix G- Activity 2- Retrieval of words

(Based on Souza, 2015).

Universidade Federal de Santa Catarina

Data: ___ / ___ / ___

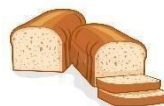
Código do Participante: _____

Turma: _____

Instrução: Relacione as colunas abaixo de acordo com o desenho correspondente:

1. Avocado

()



2. Garlic

()



3. Pineapple

()



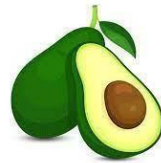
4. Rice

()



5. Butter

()



6. Bread

()



7. Honey

()



8. Cucumber

()



9. Cauliflower

()

**Appendix H- Activity 3- Retrieval of words**

Baseado em Souza, 2015.

Universidade Federal de Santa Catarina

Data: __/__/__

Código do participante: _____

Turma: _____

Instrução: Escreva os nomes das comidas em seus grupos de acordo com a pirâmide de alimentos:

Fruits



1. Tomato

2. _____

3. _____

4. _____

Vegetables



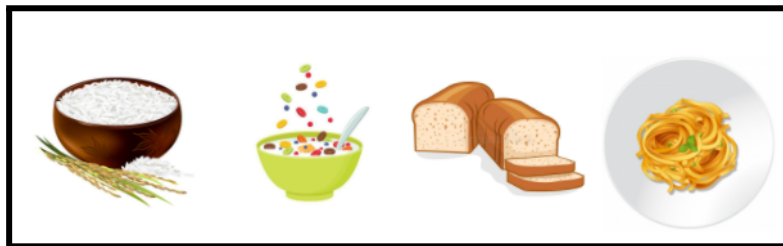
1. _____

2. _____

3. _____

4. _____

Grains



1. _____

2. _____

3. _____

4. _____

Fat, oil and sugar



1. _____

2. _____

3. _____

4. _____

Dairy



1. _____

/

2. _____

Meat and other protein



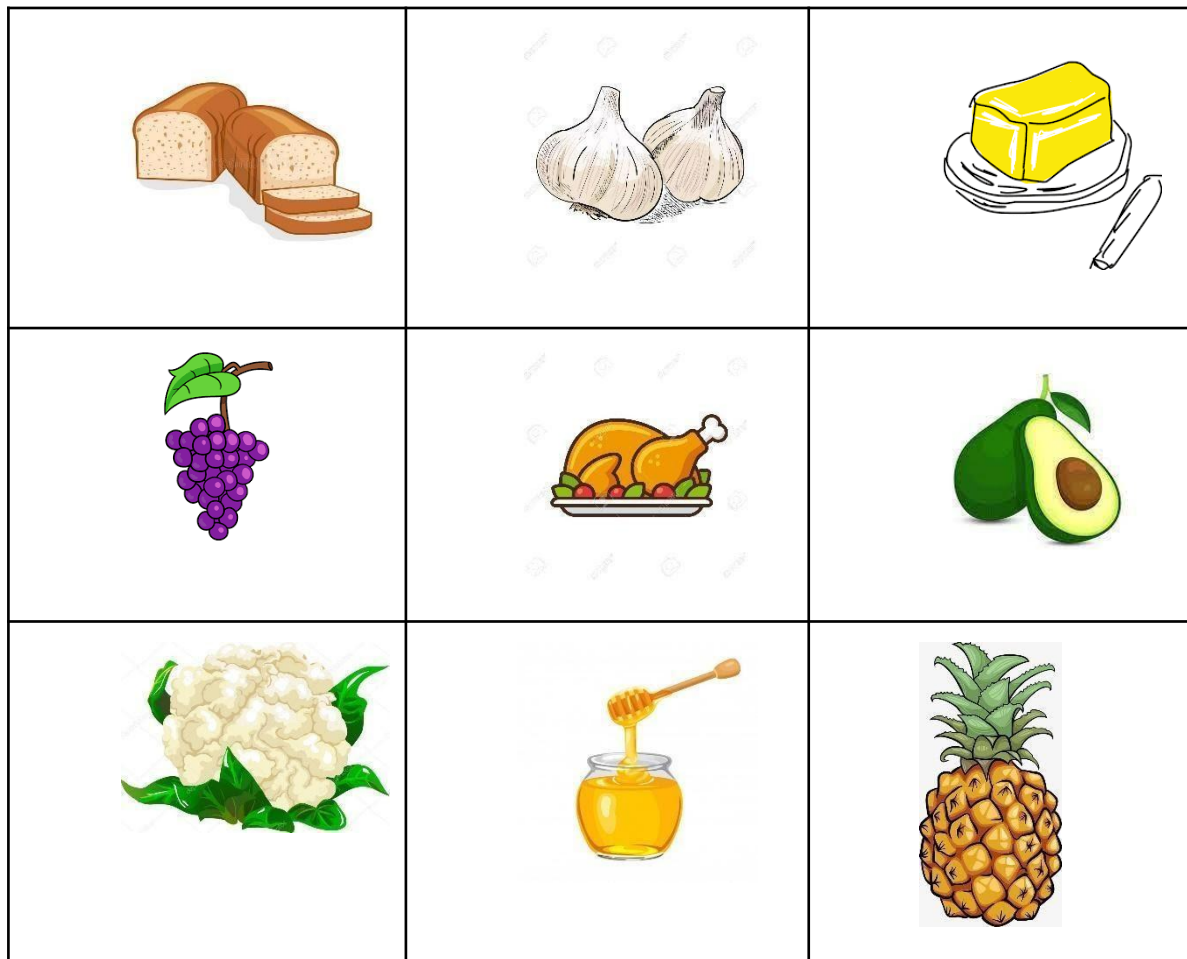
1. _____

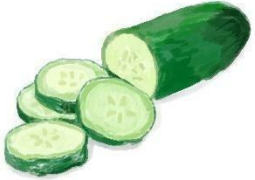

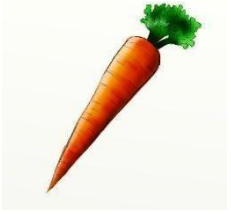

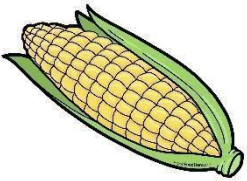


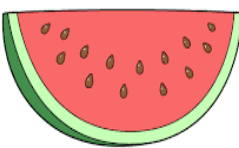


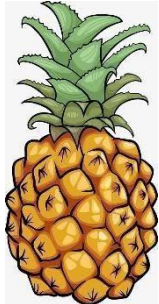
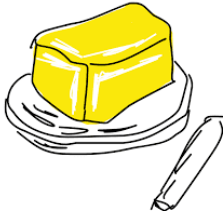
2. _____

Appendix I

Activity 4- Bingo cards

Based on Souza (2015).



Appendix J- Game Fast Vocabulary

Example of one round of the game



Appendix K- Termo de Consentimento Livre e Esclarecido

UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS
LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

baseado na Resolução 510/16 do CNS (Conselho Nacional de Saúde)

Senhores Pais e/ou responsáveis,

Eu, Rayla Rocha dos Santos, estudante de mestrado do Programa de Pós- Graduação em Inglês, sob orientação da professora Dra. Mailce Borges Mota na Universidade Federal de Santa Catarina (UFSC), venho por meio deste termo solicitar sua autorização para convidar seu/sua filho/a para participar da pesquisa intitulada "Jogos Digitais e Aprendizagem de Vocabulário em Inglês como L2: uma experiência com estudantes do ensino fundamental".

O objetivo geral do estudo é compreender melhor se a aprendizagem de palavras em inglês pode ser otimizada através de jogos educacionais digitais.

Gostaríamos de convidar seu/sua filho/a para participar como voluntário/a deste estudo. Neste termo explicaremos todos os procedimentos que serão realizados na pesquisa. Por gentileza, leia o termo com atenção para autorizar (ou não) a participação do seu(sua) filho(a) neste estudo.

Se você concordar com a participação do/a seu/sua filho/a na pesquisa, ele/a realizará as seguintes atividades:

1. Uma atividade de vocabulário em português: é uma atividade sobre as palavras da língua portuguesa.
2. Três atividades de vocabulário em inglês: são três atividades sobre algumas palavras em inglês para verificar se o estudante conhece as palavras ou não. Essas atividades serão realizadas 3 vezes cada uma, porém, em dias diferentes.

3. Aulas sobre vocabulário em inglês: três aulas serão dadas por mim para ensinar novas palavras em inglês, durante 15 minutos. Durante as aulas, alguns participantes jogarão um jogo digital e outros farão atividades de prática de vocabulário.

As atividades e as aulas serão feitas na escola do/a seu/sua filho/a na sala de mídias no turno em que estuda. A realização destas atividades e a participação nas aulas podem causar algum desconforto no seu filho/a, tais como tédio, nervosismo, ansiedade ou cansaço físico. Para evitar que as atividades sejam cansativas ou desconfortáveis, garantimos intervalos entre as atividades, de modo que as atividades sejam retomadas somente quando seu/sua filho/a estiver disposto. Durante os procedimentos de coleta de dados, que serão na escola, seu filho/a estará sempre acompanhado pelas pesquisadoras, que lhe prestarão toda a assistência necessária.

Se seu/sua filho/a quiser desistir de participar desse estudo, isso poderá ser feito a qualquer momento sem prejuízo de qualquer natureza para ele/ela.

É garantido que a identidade e privacidade do seu/sua filho/a será totalmente preservada. Não haverá divulgação de nomes ou de qualquer informação que possa levar à

1 de 3

identificação dos participantes. Cada criança receberá um código e é este código que será usado na pesquisa.

Apesar de todos os cuidados para assegurar o sigilo dos dados e da privacidade dos participantes, sempre existe a remota possibilidade da quebra do sigilo, mesmo que involuntário e não intencional. Para evitar que qualquer dado individual e pessoal do participante seja divulgado, os dados serão armazenados em um dispositivo eletrônico local ao qual apenas as pesquisadoras responsáveis terão acesso, através de senha pessoal.

Os dados gerados nesta pesquisa serão registrados em uma plataforma de acesso público chamada "Open Science Framework"(OSF). Essa prática será adotada para que qualquer pesquisador possa verificar a veracidade do estudo conduzido. Entretanto, garantimos que a identidade do seu/sua filho/a e da escola não será revelada em nenhum momento. Na planilha que será disponibilizada na OSF, os participantes serão anonimizados e utilizaremos códigos alfanuméricos (por exemplo, "Participante A1, B1, C1, etc.."). Os resultados das atividades serão relatados através de médias, não sendo possível associar esses dados a nenhum participante específico. A qualquer momento o/a Sr(a) tem a liberdade de solicitar que os dados do seu/sua filho/a sejam retirados do estudo, sem nenhum prejuízo a você ou a seu/sua filho/a. Para isso, basta entrar em contato com as pesquisadoras responsáveis pelo estudo.

Os resultados desta pesquisa poderão ser divulgados em eventos ou publicações científicas, mas nenhuma informação sobre você ou seu/sua filho/a e sobre a escola será mencionada em momento algum. O/A Sr(a) pode receber os resultados da pesquisa a qualquer momento. Para isso, é só entrar em contato com as pesquisadoras.

Se o/a Sr(a) ou seu/sua filho/a tiverem alguma despesa por causa da pesquisa, têm direito a receber ressarcimento. Se o/a Sr(a) ou seu/sua filho/a tiverem prejuízos por causa da pesquisa, têm direito à indenização.

O presente estudo foi aprovado pelo Comitê de Ética em Pesquisas com Seres Humanos da Universidade Federal de Santa Catarina (CEPSH-UFSC). Nós, pesquisadoras, nos comprometemos a realizar a pesquisa de acordo com a Resolução do Conselho Nacional de Saúde no 510, de 07 de abril de 2016, que estabelece as normas éticas para as pesquisas em Ciências Humanas e Sociais. O CEPSH-UFSC é um órgão colegiado interdisciplinar, deliberativo, consultivo e educativo e está vinculado à Universidade Federal de Santa Catarina.

O CEPESH-UFSC foi criado para defender os seus direitos, garantir que eles sejam respeitados e que a pesquisa seja realizada de forma ética, assegurando o bem-estar dos participantes. Você também pode consultar o endereço eletrônico <http://cep.ufsc.br/> para mais informações sobre o estudo. Caso tenha alguma consideração ou dúvida sobre a pesquisa, entre em contato pelo e-mail: rayla.rochast@gmail.com; ou pelo fone (47) 9 9981-1565; ou também com a professora Dra. Mailce Borges Mota, através do e-mail mailce.mota@ufsc.br. O/A Sr/Sra também pode entrar em contato com o Comitê de Ética em Pesquisa com Seres Humanos da UFSC, através do telefone (48) 3721-6094, e-mail cep.propesq@contato.ufsc.br ou no Prédio Reitoria II, Rua Desembargador Vitor Lima, nº 222, 4º andar, sala 701 – Trindade – CEP 88040-400 – Florianópolis/SC.

Caso concorde em nos autorizar a convidar seu/sua filho/a para participar de nossa pesquisa, duas vias deste documento serão rubricadas e assinadas pelo/a Sr/Sra e pelas pesquisadoras. Guarde cuidadosamente a sua via, pois é um documento que traz importantes informações de contato e garante os seus direitos como participante da pesquisa.

REGISTRO DO CONSENTIMENTO

() Concordo em autorizar que meu /minha filho/a, cujo nome é _____, seja convidado para participar da pesquisa “Jogos Digitais e Aprendizagem de Vocabulário em Inglês como L2: uma experiência com estudantes do ensino fundamental”.

Assinatura do responsável pelo/a menor

data

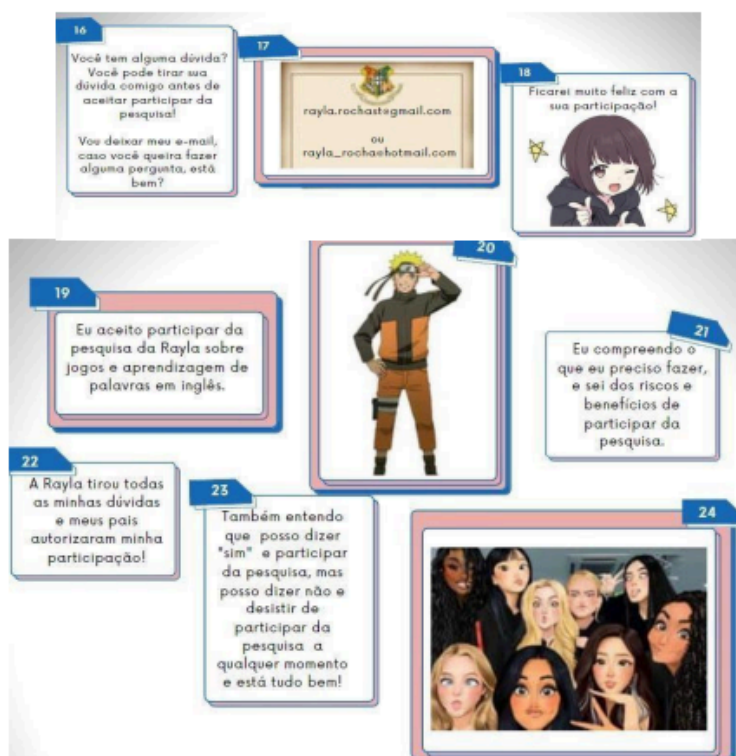
Assinatura da pesquisadora responsável

data

Assinatura da mestrandia

data

Appendix L- Termo de Assentimento Livre e Esclarecido (TALE)



Data: _/ _/ _

Assinatura e nome do(a) participante

Data _/ _/ _

Assinatura da pesquisadora