Learning English through gaming

Jurenec, Petar Krešimir

SVEUČILIŠTE U ZAGREBU
UČITELJSKI FAKULTET
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PETAR KREŠIMIR JURENEC

DIPLOMSKI RAD

LEARNING ENGLISH THROUGH GAMING

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DIPLOMSKI RAD

Ime i prezime pristupnika: Petar Krešimir Jurenec
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MENTORICA: doc. dr. sc. Ivana Cindrić

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CONTENTS

Zahvaljujem svim zaposlenicima Osnovne škole Tina Ujevića i Osnovne škole Davorina Trstenjaka koji su omogućili provedbu moga istraživanja. Također se zahvaljujem sudionicima istraživanja i njihovim roditeljima koji su dali suglasnost za sudjelovanje njihove djece u istraživanju.

Veliko hvala mojoj mentorici doc. dr. sc. Ivani Cindrić na pomoći u izradi diplomskog rada.

Najveće hvala mojoj obitelji, a posebno roditeljima Renati i Ivici na potpori tijekom mog cjelokupnog obrazovanja.

SAŽETAK

U ovom diplomskom radu prikazana je povezanost tehnologije i digitalnih igara s učenjem stranoga jezika. Diplomski je rad podijeljen u dva dijela: teorijski dio i istraživanje.

Prvi dio diplomskog rada opisuje uporabu tehnologije kao alata za učenje stranoga jezika od sredine dvadesetog stoljeća do danas. Učenje jezika uz pomoć tehnologije ima svoje prednosti, ali i svoja ograničenja koja nisu nužno negativan čimbenik jer ona potiču učitelje da budu kreativniji i kritičniji prema uporabi tehnologije u učionici. Ipak, učitelji bi trebali biti u korak s modernom tehnologijom, što mogu ostvariti putem pravilne edukacije.

Najvažnije karakteristike koje igra mora imati kako bi njena primjena u podučavanju stranog jezika imala smisla su da je ona zaista igra i da je jezično bogata kako bi se željeni ishodi mogli postići. Različiti žanrovi igara razlikuju se po načinima na koje one mogu pomoći u usvajanju jezika. Postoje igre koje su napravljene isključivo za podučavanje igrača određenim znanjima i vještinama, i postoje igre koje su napravljene u svrhu zabave. Obje vrste digitalnih igara postižu i održavaju motivaciju balansirajući izazove i nagrade. Međutim, postoje razlike između spolova u preferencijama digitalnih igara.

Drugi dio diplomskog rada prikazuje rezultate istraživanja. U istraživanju je sudjelovalo pedeset pet učenika sedmih razreda i njihove dvije učiteljice engleskoga jezika. Cilj istraživanja je bio utvrditi korelaciju između igranja digitalnih igara i znanja engleskog jezika, s hipotezom da postoji pozitivna korelacija između igranja digitalnih igara i znanja engleskog vokabulara, naročito terminologije i kratica.

Ključne riječi: tehnologija, digitalne igre, učenje stranoga jezika

ABSTRACT

In this thesis, the connection between technology and digital games, and foreign language learning will be explored. The thesis is divided into two parts: the theoretical part and research.

The first part of the thesis describes the use of technology as a tool for language learning from the mid-twentieth century until today. Language learning with technology has its advantages, but also limitations and boundaries which are not necessarily a negative factor because they make teachers be more creative and critical towards the use of technology in classroom. Still, teachers should be up to date with modern technology, which can be achieved through proper teacher education.

The most important characteristics that a game has to have in order for its implementation into foreign language teaching to make sense are that it is truly a game, and it is linguistically rich so that the desirable outcomes can be met. Different genres of games differ in the ways in which they can facilitate language acquisition. There are games that were made specifically to teach the player a certain knowledge or skill, and there are games that were made to entertain. Both types of digital games achieve and preserve motivation by balancing challenges and rewards. However, there are some differences between genders in terms of digital game preference.

The second part of the thesis presents the results of the research. The participants were fifty-five 7^{th} grade students, and two of their English teachers. The aim of the research establish correlation between playing digital games and knowledge of English, and the hypothesis was that there is a positive correlation between playing digital games and students' knowledge of vocabulary, particularly terminology and acronyms.

Key words: technology, digital games, foreign language learning

1 INTRODUCTION

Technology makes our lives easier. The advancement of technology provides for better work efficiency. The idea behind developing better technology is to helps us be more productive while putting less effort into what we are doing. Sadly, it is not always like that. Throughout history, technology for educational purposes has been used in different ways, using various methods, machines, and media. As technology advanced, its use in classrooms increased and evolved. However, it is becoming increasingly difficult for teachers to adapt to the newest technological achievements and implement them into their teaching. Although teachers still do not have to be concerned about losing their jobs to a machine, they might lose it to someone who can use the machine more efficiently. Keeping up with the newest technological achievements is of big importance to teachers and learners, as technology, especially after the introduction of the Internet, offers access to free learning resources.

The advancement of technology and its availability resulted in the popularisation of digital games. Digital games can be used for educational purposes too. There are games that were made specifically to teach the player a certain knowledge or skill, and there are games that were made to entertain. Regardless of the intention with which a digital game was made, players will inevitably learn something while playing. This paper will focus on the connection between technology and digital games, and English language learning. The aim of the research establish correlation between playing digital games and knowledge of English.

2 LANGUAGE LEARNING AND TECHNOLOGY

Technology has been used for language learning since the mid-twentieth century. Back then, machines taught and learners sat and pressed keys in response. PLATO (Programmed Logic for Automated Teaching Operations) system was created in the 1960s, at the University of Illinois and became more widespread by the 1970s. The PLATO system was very simple. Learners solved increasingly difficult tasks, and upon finishing them, depending on the learners' success, the machine either allowed them to move on or it would send them to review material. Initially, learners who used the PLATO system, learned foreign languages through basic drills, but over time, PLATO implemented audio and limited graphics.

What caused a more widespread introduction of computer use in the classroom, were microcomputers in the 1980s. Most of the tasks, though, were still drills, and the use of that particular technology was referred to as CALI (computer assisted language instruction). Davies and Higgins (1982) suggested the term 'CALL': computer-assisted or computer-aided language learning. CALL became the preferred acronym, despite different researchers and writers suggesting different acronyms, such as computer-enhanced language learning (CELL), computer-assisted writing (CAW), computer applications in second language acquisition (CASLA), and technology-assisted or technology-enhanced language learning (TALL or TELL). Both publishers and teachers began creating drills based on the PLATO system, some of which followed a certain curriculum. The British Council also worked on software for language learning. Their software included drills and simulations. Simulations did not focus on drilling, rather their goal was for the students to truly learn the language. The teacher and the learner were in charge of the learning process, not the program itself.

In the 1980s, when the Internet first became available, it was difficult for teachers and students to use it because it lacked content. They mostly used it to interact with each other in chatrooms. However, these chatrooms were not well organised because the conversations were difficult to follow when a lot of people

participated. Regardless of the technology that was used for teaching and learning, by today's standards, being primitive, the term ICT (information and communication technology) became widely used across education. The term CMC (computer-mediated communication) was also used to emphasize the communication between the learners via Internet. Nowadays, mobile devices are becoming more common among language learners, so new terminology is going to be needed.

As technology advances, its role, as well as the role of the teacher and the learner, in education, changes. In 1983, British researcher and theoretician John Higgins explained the role of the technology in education like this:

> For years people have been trying to turn the computer into a magister. They do this by making it carry the learning system know as Programmed Learning (PL)…. PL in fact does not need a computer or any other machinery; it can be used just as effectively in paper form, and computers which are used exclusively for PL are sometimes known disparagingly as page-turners. The real magister is the person who wrote materials and imagined the kind of conversation he might have with an imaginary student.
>
> Suppose, instead, that we try to make the machine into a pedagogue. Now we cannot write out the lessons in advance, because we do not know exactly how they will go, what the young master will demand. All we can do is supply the machine with a template to create certain kinds of activities, so that, when these are asked for, they are available. The computer becomes a task-setter, an opponent in a game, an environment, a conversational partner, a stooge or a tool. (Higgins, 1983, p. 4)

According to Higgins, the ultimate goal of technology in learning is to track the knowledge and the progress of each individual student, and then provide the students with the materials and tasks accordingly. Apart from Higgins's magister - pedagogue dichotomy, there are a few other taxonomies regarding the role of technology in education. Two well-known taxonomies are from Warschauer (1996) and Bax (2003). There are three stages in Warschauer's model: 'behaviouristic', 'communicative', and 'integrative'. Behaviouristic CALL is focused on drilling and practising using different programs like PLATO, instrumental CALL uses technology (computers) as a tool, and integrative CALL fully integrates technology into classroom practice and language learning. Bax's model is similar to Warschauer's. It also consists of three stages: 'restricted', 'open', and 'integrated' CALL. The first stage is called restricted because early use of technology in language teaching was limited. We are currently in the open stage, for we do use technology in education, but it is still not as integrated and as normalised as in integrated stage. Bax explains integrated technology by writing:

> This concept is relevant to any kind of technological innovation and refers to the stage when the technology becomes invisible, embedded, in everyday practice and hence 'normalised'. To some commonplace examples, a wristwatch, a pen, shoes, writing - these are all technologies which have become normalised to the extent that we hardly even recognise them as technologies. (Bax, 2003, p. 23)

It is important for teachers to stay updated when it comes to technology. Although it is a challenge to keep up with technology, the use of it in everyday life, and in classroom is inevitable. The use of technology should not put teachers in a passive role even if they use it on a daily basis and create various different activities. Only by doing so will technology become truly invisible, and fully integrated in the classroom. "The computer does not teach; it assists learning or creates an environment in which learning can occur." (Healey, 2016, p. 14).

With the advancement of technology in 1990s, the Internet became more accessible and user-friendly. Teachers and learners could easily access teaching and learning materials on-line. The popularity of the Internet grew rapidly because it was a seemingly endless and ever-expanding resource of different materials, and, maybe even most importantly, it was free. The notion that everything on the Internet was free was often misleading because it resulted in widespread piracy which, alongside viruses, email scams, and malicious websites, was just one of the negative sides of the Internet that its users experience to this day. Online courses became a reality with the expansion of the Internet, giving learners the opportunity to express themselves orally online via Skype or similar programs. Internet users are able to create their own materials and upload them on different platforms. That feature can be used by teachers and learners, and it is especially useful when the tasks require a certain amount of creativity. Easily accessible Internet together with the array of devices which can be used to access it facilitate foreign language acquisition through the use of social media, multimedia, and games. "For language teachers and learners, a communication-rich context offers wonderful opportunities for meaningful interaction and motivated learning." (Healey 2016, p. 19).

In the nearer future, learners will become more and more autonomous in their language learning. The Internet allows them to form their own learning strategies and download materials that they like. With the role of technology in language learning changing, and the increasing autonomy of learners, teachers will have to adapt to the situation or they might risk being rendered useless.

3 LIMITATIONS AND BOUNDARIES IN LANGUAGE LEARNING AND TECHNOLOGY

"Technology shapes our sense of what is possible by modifying, reframing or eliminating existing limits and boundaries." (Kern & Malinowski, 2016, p. 197). The word *technology* comes from the Greek words *techne* (art, skill) and *logos* (word, discourse). The Greeks used the word *technology* to refer to a systematic treatment of grammar. In the mid-19th century, technology started being used to refer to a science of mechanical and industrial arts. Marshall McLuhan (1964) wrote that technologies and media are just extensions of man which extend our capabilities by overcoming natural limitations of our bodies, perception, and consciousness. Even though technology is a massive factor in the lives of people today, it should not change who we are, but merely serve as a tool that makes our actions easier. Like every other tool, technology has its limitations and boundaries, although it is thought that it only eliminates them, in reality, it creates a set of its own. It is important that teachers identify those limitations and boundaries, and incorporate technology in their teaching in such a way that it enhances learning experience without making it more difficult just for the sake of using technology.

Table 1 Examples of technology both creating and transcending limits and boundaries (Kern & Malinowski, 2016, p. 201)

Boundaries/limits blurred/overcome by technology	Boundaries/ limits created by technology
Spatial boundaries, e.g. geographical, national borders, local (rooms/labs)	Interface constraints (window and screen size, view frame, hardware/software features and functionality); limitations to in-class mobility, mutuality of perception
Temporal boundaries, e.g. international time zones, what is 'in-class' and 'out-class' time	Constraints on modes and forms of expression (e.g. capacity of the medium to represent speech, writing, gesture, graphics)
Linguistic boundaries made permeable by	Variable access to Internet, hardware,

online automated translation, cross linguistic dictionaries	software; learners' decreased access to and awareness of context, connotation, contingency in language use
Material boundaries between image, sound, video, etc. blurred by common digital data structure	Constraints related to users' digital literacies and technological know-how
Intra- and extra-institutional roles and relationships transformed: teacher-student; classroom-community, etc., leading to greater individual access and power	Variable access to and accessibility to facilities, tools, networks; privatisation of knowledge and resources; redistribution of institutional authority
Text boundaries: in the case of hypertext, where does 'the text' end? Textual practices reimagined, with focus on procedural knowledge	Search, filtering, censorship of content assume new roles and authority; division between 'writers' and 'designers', 'authors' and 'coders'
Boundaries between author and reader - production and consumption are blurred by social media, computer-mediated communication (CMC), hypertext	Keyboard configuration (e.g. alphabetic keyboard for nonalphabetic writing systems), character encoding, online language support etc. highly unequal among languages

> Meaningful access to ICT comprises far more than merely providing computers and Internet connections. Rather, access to ICT is embedded in a complex array of factors encompassing physical, digital, human, and social resources and relationships. Content and language, literacy and education, and community and institutional structures must all be taken into account if meaningful access to new technologies is to be provided. (Warschauer, 2003, p. 6)

It is important to note that teachers' experience of using technology in class is different to learners' experience. Teachers have to think about more things simultaneously, they still have to manage the classroom, think about methodology, help their students, focus on the lesson and their students' needs, etc. all the while using technology in a meaningful way. The existence of limitations and boundaries of technology is not necessarily negative, rather it makes teachers be more creative and more critical towards the use of technology in classroom. In the end, they might use it more meaningfully, when it is actually needed, not just because it makes their jobs easier.

4 TEACHER EDUCATION AND TECHNOLOGY

The opinion that teachers should be up to date with modern technology and that they should try to incorporate it into their teaching is widely accepted. What is keeping most teachers from doing so is appropriate education when it comes to using technology for educational purposes. They are often left on their own acquire technology skills and study the potential educational benefits of technology. Teachers who are not familiar with modern technology might even resist studying it because they might feel like they do not need it or that they will not be able to comprehend it. On the other hand, those who are familiar with modern technology might be hired just because of the fact that the school is lacking someone who is proficient in that field, so that they can help other teachers and the rest of the school staff, and ultimately end up with insufficient time for their own work-related responsibilities. If the trend of lack of proper teacher training continues, teachers are going to face certain difficulties in the future because, as technology advances, their learners' expectations are going to rise as well.

Teachers resort to free MOOCs (massive online open course) that can provide them with information about educational technology. According to Hanson-Smith (2016), the advantages of MOOCs are:

- Courses need to go through an extensive review system; anyone can offer a course, but university sponsorship can give it more credibility. MOOC courses can adapt rapidly to changes in technology and incorporate new teaching ideas
- Courses can be relatively short; many are five or six weeks in length, and can thus fit into the schedule of working professionals, though many are also traditional ten to fourteen weeks.
- Courses are online twenty-four hours a day and this can be accessed in any time zone.
- Courses are often free, though many also offer an optional extension study certificate or statement of accomplishment as a way of recognising the time and effort put into such a course. Verified certificates usually are accompanied by a fee, but this is generally quite modest compared to enrolling in a university.
- Course materials can be viewed in any of a number of popular word languages; courses are offered by universities around the world in local language.
- Course materials are usually made downloadable, so even in low-access situations (such as dial-up Internet) students can save materials to their own computers for future use.
- Most interfaces also run on mobile devices, such as tablets and cellular phones, used by over 2 billion people on the planet
- Most universities make a point of including handicapped-accessible features, such as closed-captioning for videos and descriptive text for images.

- Student teachers usually have access to materials after the course has closed so that they can continue to review and study; some courses are open indefinitely.
- Teachers are an ideal audience, as they are generally self-motivated and eager to have further professional development; MOOC students have to be self-starters. (p. 213)

Due to all of the advantages that MOOCs offer, they are an excellent way of updating teachers' knowledge about educational technology. Another positive phenomenon of MOOCs is its participants' willingness to communicate with each other. Teachers can also learn through communication with other teachers by helping or advising each other, therefore expanding their knowledge by sharing their own and listening to their colleagues' opinions and experiences.

For those teachers who prefer offline over online experiences, there are a number of professional conventions on technology. One of those conventions is IATEFL's (the Europe-based International Association of Teachers of English as a Foreign Language) weeklong annual convention during which there are presentations on technology for an entire day. The presentations are sponsored by LTSIG (Learning Technology Special Interest Group). Apart from the presentations, LTSIG also offers annual Virtual Round Table, which is a web conference on technology that lasts for three days. Both presentations and web conference are recorded and archived for future use. Another organisation similar to IATEFL is TESOL (Teachers of English to Speakers of Other Languages). Some of TESOL's courses include topics in technology, but they are not free. While professional organisations like IATEFL and TESOL offer help to teachers who want to know more about technology, they are not available to everyone, nor do they answer each of the teachers' specific questions. A more convenient way of learning about educational technology would be CoPs (Community of practice). CoPs form usually form naturally in social settings whenever there is a problem that has to be solved. Members of CoPs share their knowledge and help each other during and after schooling. Being part of a CoP is a big commitment, though, because the sole existence of CoPs depends on the activity of its community and their continual collaboration.

5 METAPHORS FOR DIGITAL GAMES AND LANGUAGE LEARNING

Gaming was once seen as an activity reserved exclusively for children and young adults. Today, the situation is very much different. According to Entertainment Software Association (2018), the average gamer from the USA is 34 years old, with women making up for 45% and men 55% of the gaming community. The gaming industry is growing rapidly, and if the trend continues, it is not unlikely that we will witness the integration and normalisation of digital games in classroom. Before implementing digital games in classroom, teachers have to choose an appropriate game. The most important characteristics that a game has to have in order for its implementation to make sense are that the chosen game has to truly be a game, and it has to be linguistically rich so that the desirable outcomes can be met. There certainly are many games that meet those standards because, as technology advances, so does the quality of digital games and, consequently, the language used in them, e.g. in-game dialogs are becoming linguistically richer, players are exposed to language through audio output, some games have very complex language… Many learners also play digital games outside the classroom, thus learning a foreign language from a linguistically rich source spontaneously, while having fun. The accelerated growth of the gaming industry, prompted the coining of the term 'gamification'. According to a dictionary entry, 'gamification' means "the process of adding games or gamelike elements to something (such as a task) so as to encourage participation" (Merriam-Webster, 2018). Learners seem to be motivated to play digital games, so the idea is to replicate that same motivation and engagement into language learning.

> The argument is that if the game design mechanics that teach and motivate players can be analysed and transferred to traditional 'analogue' L2 learning activities; learners might be as engaged in them as they are in digital gaming. Teaching then becomes 'game-informed', 'game-inspired' or 'gameful' - and game becomes a metaphor for method. (Reinhardt & Thorne, 2016, p. 416)

Today's digital games are diverse. They differ in the way they look and the way they are played making it very difficult classify according to genre. It is far easier to put them into several genres because single-genre games are becoming vastly outnumbered by hybrid games. The earliest genres of digital games included shooter games, sports games, adventure games, and role playing-games. Traditional

game classification that is still used today, uses five genres to describe different types of games: action, adventure, role play, strategy, and simulation. Action games are games that typically require hand-eye coordination, quick reaction time, physical dexterity, and usually involve battling opponents and overcoming challenging obstacles. Adventure games are games in which the player chooses or gets assigned with a character, explores, solves puzzles and follows a storyline. Role-playing games (RPGs) are defined by character creation at the beginning of the game, and goal-oriented quest completion in a fictional setting throughout the game. There are two types of RPGs: 'Eastern' and 'Western'. In 'Eastern' RPGs, the player controls a group of avatars, while in 'Western' RPGs, the player controls a single avatar. Strategy games involve skilful thinking, planning, and battling opponents to achieve victory. There are two types of strategy games: real-time strategies and turn-based strategies. Real-time strategies allow players to play simultaneously, while in turn-based strategies each player can take his/her time to think, make a move, and finish his/her turn, then the next player (other player, if it is a one on one game) is allowed to play. That is why strategy games are often compared with chess. Simulation games simulate real world activities, such as managing a business or making strategic choices during a war. Every single element of each of the genres can be combined to make a hybrid genre, therefore making it impossible to put certain games into a single genre.

> Games in any of these genres may incorporate more or fewer affordances for language use, depending on how central language is in learning game rules, whether players are required to follow narratives in order to play and the extent to which player-to-player interaction is required for gameplay. (Reinhardt & Thorne, 2016, p. 418)

Action games generally do not offer a rich linguistic environment within the games themselves, but they can facilitate language acquisition through discussing different strategies with other players. Adventure games, on the other hand, are rich with language because of their narrative nature and puzzles that demand language comprehension. Role-playing games also demand language comprehension which is important for completing quests. Strategy and simulation games are commonly rich with language too, but it might be more difficult to acquire language through those games because sometimes the language is so complex and seemingly unimportant that the players do not even bother with it. However, the players who want to

thoroughly study the game will definitely learn new words that are needed to comprehend different game mechanics.

Digital games can take on a tutoring function. When played, games can tutor players by exposing them to a foreign language. This resembles Higgins's (1983) pedagogue metaphor. In that way, digital games do not force learners to learn, but simply facilitate learning by setting tasks that are not directly made specifically as a tool for learning language, but use language as a medium between the game and the learner. Some teachers may think that language used in most digital games is not appropriate for their learners, or that it is not necessary for their learners to be familiar with the vocabulary used in those games because they are not obliged to acquire it according to the curriculum.

> Still, even games with limited registers contextualise vocabulary comprehension for the very real purpose of gameplay, and so offer opportunities for contextualised language use. In this way, digital games might be understood as interactive texts, especially useful for reading development, and similar to uses of literature and film, such games are more effective as learning environments when supplemented with focused vocabulary, discussion and writing activities in classroom contexts. (Reinhardt & Thorne, 2016, p. 420)

Digital games can be seen as language learning tools when it comes to L2 learning, as well. A device on which a digital game is played or the game itself can provide players with plenty opportunities to interact with L2 discourses, and other players, hence a digital game can be viewed as an L2 learning tool that mediates the interaction. The main factors that decide whether a game is convenient enough to be used as a tool the quality and the quantity of interaction that the game can provide. Chat or voice chat are the most common ways of interaction, that is why multiplayer games especially make good tools for L2 learning. Although the highly specialised vocabulary used in multiplayer games is definitely useful in a certain game's environment, sometimes it is of limited use outside of gaming context.

Digital games can also be percieved as ecologies. Gamers do not only learn l2 directly from the game while playing it. They also learn it by watching videos and reading texts related to games, talking to other gamers, analysing game mechanics, writing game critiques, or even creating games themselves.

> Gamers play games, and thus potentially learn, at any time, at any place, from anyone, in both productive and consumer roles, for entertainment as well as for more 'serious' purposes. From this perspective, game playing is an interconnected ecology of social-cultural texts and practices that have the potential to extend as well as

> transform traditional or 'transmission' notions of learning from teachers and textbooks. (Reinhardt & Thorne, 2016, p. 421)

In addition to games being understood as tutors, tools, and ecologies, they can also be understood as a method, or a learning activity. Some elements of some digital games can be incorporated into a learning activity, making the lesson game-like. One of the characteristics of digital games that can be incorporated into learning activities is goal-oriented behaviour. Well-designed games, just as well-designed activities, provide learners with: challenges that are increasingly more difficult, while still having an end goal; meaningful and appropriate feedback; a sense of agency and control, regardless of the existence of rules that have to be followed. Van den Branden, Bygate and Norris (2009) state that tasks should be contextualised, relevant and learning centred, and are ideally student-driven and thus motivating and effective. If L2 pedagogy was game-informed, learners would have constant and customizable access to their own goal progress. In practice, however, game as method is not often used which could lead to learners' decline in motivation.

According to Salen and Zimmerman (2004) good digital games are engaging and immersive because they are interactive in several different ways. They are interactive because they: engage players cinematically through narratives, music, and graphics; allow players to explicitly interact with the elements in the game; interactive on a cultural level. The same level of engagement could be achieved in L2 teaching by copying the immersive features of digital games' interaction. Without interaction, language learning is not nearly as potent.

Another feature of well-designed games that can be implemented into learning activities is meaningful feedback. For feedback to be meaningful it has to be obvious, individualised, come at the right time and bring a suitable message which motivates students to continue with the activity. Learners should also have an opportunity to revisit their mistakes, just like in digital games.

In addition to having a clear set of rules and a goal-oriented structure, a successful game should also provide with a meaningful context through an in-game narrative in order for it to be truly well designed and successful. This feature of digital games, if translated properly into language learning activities, is what separates drilling from acquiring the language naturally.

> Language pedagogy informed by game design principles of situated goal-directed activity would recognise that just as a game rule has no function without designed

> narratives, language form has no meaning without narrative context. Just as a game is not a game until it is played, language is a mere abstraction until it is put to meaningful use. (Reinhardt & Thorne, 2016, p. 426)

Motivation is a big predictor of success in a certain field. Digital games are generally quite successful in motivating their players. If L2 pedagogy copied digital games when it comes to motivation, perhaps learners would maintain their motivation throughout the learning process. Digital games achieve and preserve motivation by balancing challenges and rewards. The bigger the challenge, the better the reward. The activity should not be too challenging because players (learners) might get frustrated, but it also should not be too easy so it is not too boring. That is why learning activities should be individualised.

6 MINI-GAMES FOR LANGUAGE LEARNING

According to Cornillie and Desment (2016) mini-games for language learning are defined as technology-based activities that are intended to improve learners' mastery of specific linguistic constructions in a second or foreign language (L2); which afford explicit, for-focused, bite-size, and typically fast-paced practice; which offer immediate feedback on learners' responses; that are goal-directed in the sense that learners pursue non-linguistic goals in addition to practising their language skills.

Cornillie and Desment (2016) make a distinction between mini-games and situated avatar-based games. According to them the main differences between mini-games and situated avatar-based games are that mini-games are more constrained when it comes to gameplay, which is simpler; and playtime, which is shorter. "Hence, playing a mini-game requires only basic problem-solving and simple cognitive-motor skills, and mini-games are typically played in short bursts." (Cornillie & Desment, 2016, p. 433). Cornillie and Desment (2016) also claim that mini-games are typically singleplayer games and are often played on mobile phones, whereas situated avatar-based games require more advanced hardware configurations. It is believed that casual gamers, and people who do not consider themselves gamers at all are more likely to play mini-games on mobile phones, than games that require more time and effort, and are usually played on consoles and/or PCs. In the context of digital game-based language learning (DGBLL), the

aforementioned differences are very important. “Because of their casual nature and more constrained scope, they appear to be particularly suitable for focused practice of enabling L2 skills (that is to say, knowledge of vocabulary, grammar, spelling or pronunciation.” (Cornillie & Desment, 2016, p. 433). On the other hand, mini-games do not improve listening, speaking, reading, writing, intercultural, and social competences as much as non-mini digital dames do.

The design of a mini-game is of crucial importance in DGBLL. The design of a mini-game depends on the designer’s intended purpose of the game. Mini-games can be divided into games that are made to entertain, and games that are made to educate. Both types of games offer a more or less rich linguistic environment, but it their purpose is what makes them different.

Cornillie and Desment (2016) distinguish four broad categories of games to support L2 learning: mini-games designed for L2TL (second language teaching and learning) purposes; off-the-shelf mini-games; situated avatar-based games that were designed for L2TL; and off-the-shelf situated avatar-based games.

Mini-games are the most suitable for L2 learning because they are generally cheaper than other types of games; they are easier to integrate in L2 teaching curricula because of their simplicity; and it is easy to measure learners’ progress, give feedback and support using mini-games, because the game can do those things automatically, instead of the teacher.

Cornillie and Desmet (2016) grouped design attributes of mini-games into two sets, depending on their primary objective. The first set of attributes is primarily linguistic-pedagogical in nature, and the second set includes typical design elements of games or game attributes. The first set facilitates L2 learning, and the second set is concerned with non-linguistic goals and its intention is to increase the playtime.

Table 2 Linguistic-pedagogical attributes of mini-games (Cornillie & Desmet, 2016, p. 436)

Attribute	Description
Linguistic focus and learning aim	What the game focuses on from a linguistic point of view, and which enabling skills (knowledge of lexicon, spelling, grammar) and main skills (reading, writing, listening, speaking) are addressed.
Context and meaning focus	How the linguistic constructions are contextualised (decontextualized,

	contextualised at the level of the chunk or sentence, or as part of a story), and thus how the learner's attention is focused on meaning.
Response design	How the software constrains (the types of) responses that learners are allowed to give. Typically, mini-games have closed-response designs, with selected response measures such as multiple choice, but more open-response designs are also possible, such as typing or even speaking.
Item selection and sequencing	How particular items are selected and sequenced (and repeated) throughout practice. A popular sequencing technique in mini-games is the spaced repetition system designed by Leitner (1972), which repeats more often those items which the learner frequently answers incorrectly.
Learner control	To what extent the learner (rather than the system alone) may control aspects of practice, such as content or pace.
Assessment and feedback	How the game assesses performance and how it gives feedback ('knowledge of results' feedback, or more extensive linguistic explanation).

Table 3 Game attributes of mini-games (Cornillie & Desmet, 2016, p. 437)

Attribute	Description
Excessive positive feedback and rewarding	Feedback in response to desirable behaviour that is often disproportionate to the action required from the user; also called *juicy* feedback (Juul, 2010, p. 45). Examples are: points and excessive animations for single actions; badges, praise, etc. for longer-term performance.
Competition	Competition with oneself (personal best score), with artificially intelligent opponents,

	with other players, or between groups of players. Aggregation of highest scores on leaderboards.
Time pressure	Whether or not players need to compete with time while striving to complete objectives.
Fantasy	'Make-believe environment, scenarios, or characters' (Bedwell, Pavlas, Heyne, Lazzara and Salas, 2014, p. 4) that are inherent in the format of the game (not in its content). An example is representing response options as balloons to pop. This term traces back to Malone's (1981) pioneering work on instructional games, and is not to be confused with the genre of fantasy games.
Game core and non-linguistic outcomes	The challenge that critically requires player involvement in the interaction (e.g. a language exercise linked to the fantasy of a fish in a leaking tank), and the non-linguistic outcomes that come with resolution of the challenge (e.g. saving the fish).
Positive failure feedback	Communication of failure (i.e. corrective feedback) that supports the player's motivation, for instance through engaging and varied animations. Typically contingent upon the fantasy of the game (e.g. the fish goes to heaven).
Story	Elements of narrative included in the content (items) of the game.

Mini-games designed for L2TL resemble drills as they have a lot of repetition, feedback, and a goal of developing certain knowledge. Three types of drills have been distinguished (DeKeyser, 2007; Paulston & Bruder, 1976): mechanical, meaningdul and communicative. Mechanical drills are based on answering the questions correctly, they do not, however, require comprehension. Meaningful drills require comprehension on a structural and a semantic level. Communicative drills demand that learners add information to the provided context.

"Mini-games are similar to drills in a number of aspects: they focus on specific linguistic constructions, they involve a great deal of repetition and feedback, and there is a certain behaviourist ring to their reward mechanisms." (Cornillie & Desment, 2016, p. 439). Due to mini-games being programmed in such a way that they offer progressively more difficult tasks, and individualised feedback, they are perfect for automatization of knowledge which is the ultimate goal of L2 learning.

Cornillie and Desment (2016) recommend a five-step cycle while designing or evaluating mini-games for use in L2TL: a 360-degree and user-centred needs analysis; the provision of explicit instruction prior to play; creation of a purposeful context for practice; meaning-focused practice with mini-games; and communicative follow-up activities with space for a wide range of corrective feedback types. A 360-degree analysis looks at the teaching and learning context, linguistic needs, nature of the linguistic constructions, learners' culture, and their individual differences. Before playing the game, learners have to acquire declarative knowledge that is helpful for playing. Without that, playing mini-games would be ineffective and even frustrating for the learners. A purposeful context has to be provided. It will motivate the learners and make the experience meaningful. As learners progress, practice has to become increasingly more difficult. It will keep the learners interested in the game and make them learn more. Finally, practice has to be continued by transferring it into communicative activities which allow other L2 skills, that are not required in the game, to be used and improved.

7 GAMING AND YOUNG LANGUAGE LEARNERS

"Interpretations differ but, legally, the term 'young learner' refers to any child under the age of 18 for whom there are welfare and duty of care requirements." (Ellis, 2014, p. 75). Paul Gee (2003) defined thirty-six learning principles that are built into good video games. Every principle is equally important. He uses the term 'video games' to refer to games played on consoles and computers. Nowadays, the term 'digital games' is preferred because it includes games played on consoles, computers, and other devices, such as mobile phones or tablets.

Table 4 Learning principles according to Paul Gee (Gee, 2003, p. 207-212)

Principle	Description

Active, Critical Learning Principle	All aspects of the learning environment (including the ways in which the semiotic domain is designed and presented) are set up to encourage active and critical, not passive, learning.
Design Principle	Learning about and coming to appreciate design and design principles is core to the learning experience.
Semiotic Principle	Learning about and coming to appreciate interrelations within and across multiple sign systems (images, words, actions, symbols, artifacts, etc.) as a complex system is core to the learning experience.
Semiotic Domains Principle	Learning involves mastering, at some level, semiotic domains, and being able to participate, at some level, in the affinity group or groups connected to them.
Metalevel Thinking about Semiotic Domains Principle	Learning involves active and critical thinking about the relationships of the semiotic domain being learned to other semiotic domains.
"Psychosocial Moratorium" Principle	Learners can take risks in a space where real-world consequences are lowered.
Committed Learning Principle	Learners participate in an extended engagement (lots of effort and practice) as extensions of their real-world identities in relation to a virtual identity to which they feel some commitment and a virtual world that they find compelling.
Identity Principle	Learning involves taking on and playing with identities in such a way that the learner has real choices (in developing the virtual identity) and ample opportunity to meditate on the relationship between new identities and old ones. There is a tripartite play of identities as learners relate, and reflect on, their

	multiple real-world identities, a virtual identity, and a projective identity.
Self-Knowledge Principle	The virtual world is constructed in such a way that learners learn not only about the domain but about themselves and their current and potential capacities.
Amplification of Input Principle	For a little input, learners get a lot of output.
Achievement Principle	For learners of all levels of skill there are intrinsic rewards from the beginning, customized to each learner's level, effort, and growing mastery and signaling the learner's ongoing achievements.
Practice Principle	Learners get lots and lots of practice in a context where the practice is not boring (i.e., in a virtual world that is compelling to learners on their own terms and where the learners experience ongoing success). They spend lots of time on task.
Ongoing Learning Principle	The distinction between learner and master is vague, since learners, thanks to the operation of the "regime of competence" principle listed next, must, at higher and higher levels, undo their routinized mastery to adapt to new or changed conditions. There are cycles of new learning, automatization, undoing automatization, and new reorganized automatization.
"Regime of Competence" Principle	The learner gets ample opportunity to operate within, but at the outer edge of, his or her resources, so that at those points things are felt as challenging but not "undoable."
Probing Principle	Learning is a cycle of probing the world (doing something); reflecting in and

	on this action and, on this basis, forming a hypothesis; reprobing the world to test this hypothesis; and then accepting or rethinking the hypothesis.
Multiple Routes Principle	There are multiple ways to make progress or move ahead. This allows learners to make choices, rely on their own strengths and styles of learning and problem solving, while also exploring alternative styles.
Situated Meaning Principle	The meanings of signs (words, actions, objects, artifacts, symbols, texts, etc.) are situated in embodied experience. Meanings are not general or decontextulized. Whatever generality meanings come to have is discovered bottom up via embodied experiences.
Text Principle	Texts are not understood purely verbally (i.e., only in terms of the definitions of the words in the text and their text-internal relationships to each other) but are understood in terms of embodied experiences. Learners move back and forth between texts and embodied experiences. More purely verbal understanding (reading texts apart from embodied action) comes only when learners have had enough embodied experience in the domain and ample experiences with similar texts.
Intertextual Principle	The learner understands texts as a family ("genre") of related texts and understands any one such text in relation to others in the family, but only after having achieved embodied understandings of some texts. Understanding a group of texts as a family (genre) of texts is a large part of what helps the learner make sense of such texts.
Multimodal	Meaning and knowledge are built up through various modalities

Principle	(images, texts, symbols, interactions, abstract design, sound, etc.), not just words.
"Material Intelligence" Principle	Thinking, problem solving, and knowledge are "stored" in material objects and the environment. This frees learners to engage their minds with other things while combining the results of their own thinking with the knowledge stored in material objects and the environment to achieve yet more powerful effects.
Intuitive Knowledge Principle	Intuitive or tacit knowledge built up in repeated practice and experience, often in association with an affinity group, counts a great deal and is honored. Not just verbal and conscious knowledge is rewarded.
Subset Principle	Learning even at its start takes place in a (simplified) subset of the real domain.
Incremental Principle	Learning situations are ordered in the early stages so that earlier cases lead to generalizations that are fruitful for later cases. When learners face more complex cases later, the learning space (the number and type of guesses the learner can make) is constrained by the sorts of fruitful patterns or generalizations the learner has found earlier.
Concentrated Sample Principle	The learner sees, especially early on, many more instances of fundamental signs and actions than would be the case in a less controlled sample. Fundamental signs and actions are concentrated in the early stages so that learners get to practice them often and learn them well.
Bottom-up Basic Skills Principle	Basic skills are not learned in isolation or out of context; rather, what counts

	as a basic skill is discovered bottom up by engaging in more and more of the game/domain or game/domains like it. Basic skills are genre elements of a given type of game/domain.
Explicit Information On-Demand and Just-in-Time Principle	The learner is given explicit information both on-demand and just-in-time, when the learner needs it or just at the point where the information can best be understood and used in practice.
Discovery Principle	Overt telling is kept to a well-thought-out minimum, allowing ample opportunity for the learner to experiment and make discoveries.
Transfer Principle	Learners are given ample opportunity to practice, and support for, transferring what they have learned earlier to later problems, including problems that require adapting and transforming that earlier learning.
Cultural Models about the World Principle	Learning is set up in such a way that learners come to think consciously and reflectively about some of their cultural models regarding the world, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models that may conflict with or otherwise relate to them in various ways.
Cultural Models about Learning Principle	Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models of learning and themselves as learners, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models of learning and themselves as learners.
Cultural Models about Semiotic Domains Principle	Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models about a particular semiotic

	domain they are learning, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models about this domain.
Distributed Principle	Meaning/knowledge is distributed across the learner, objects, tools, symbols, technologies, and the environment.
Dispersed Principle	Meaning/knowledge is dispersed in the sense that the learner shares it with others outside the domain/game, some of whom the learner may rarely or never see face-to-face.
Affinity Group Principle	Learners constitute an "affinity group," that is, a group that is bonded primarily through shared endeavors, goals, and practices and not shared race, gender, nation, ethnicity, or culture.
Insider Principle	The learner is an "insider," "teacher," and "producer" (not just a "consumer") able to customize the learning experience and domain/game from the beginning and throughout the experience

According to this extensive table, digital games, which might seem like an educationally fruitless media, have many educational benefits. Therefore, the implementation of quality digital games into teaching would could have a positive impact on the learners' motivation and learning.

There are some differences between genders in terms of digital game preference. Kafai (1996) observed that the biggest difference between digital games that boys like and the ones that girls like is in the level of violence in the games. Boys like more violent games, and the current commercial-off-the-shelf (COTS) games lean towards male audience. Still, most games are designed and marketed for boys. Therefore, it is fair to say that the preferences of boys are privileged over the preferences of girls. The majority of the games used in classrooms are educational games that serve specific purposes, while most of the games that are played in informal settings are COTS games. Naturally, COTS games are more appealing.

Still, even educational games are hard to incorporate into teaching, for example: if their educational aims do not match those from the curriculum, if the teacher does not use them well, or if the parents do not agree with digital games being a part of their children's learning experience.

Salonius-Paster and Gelfond (2005) found that boys play games more frequently and for longer periods of time than girls. Boys tend to play games with a lot of action, and competition, and girls tend to play games with in-depth social interactions and character development. Kinzie and Joseph (2008) noticed that boys are far more likely to play active-mode, and strategic-mode games. Girls, on the other hand, are more likely to play games that offer creative and explorative modes. Kafai (1998) identified the differences between boys and girls in how they end their game-playing sessions. Boys stop playing when they win, or lose, while girls stop playing when they get bored. Wilder, Mackie and Cooper (2004) found that girls underrated their ease of interaction and skill when it comes to operating a computer. They also noticed that girls are more likely to lose confidence after making a mistake while working on a computer. That might be the reason why there are more boys playing digital games than girls.

Although the gaming industry is clearly boy-oriented, it still offers different kinds of games. DeHaan (2005) divided COTS games into four genres: sports; virtual pet; simulation: and role-playing and action/adventure games. According to him, games that are classified into the first three genres are beneficial for language learning, and the games that are classified into the fourth genre are not. The reason that he gives for the fourth genre not being beneficial is that games which belong to that genre are linguistically too complex for young learners, and the text that is shown on the screen often does not correspond to the picture.

Kinzie and Joseph (2008) suggest a different model of game categorisation. They suggest six activity modes to describe types of gameplay: active; explorative; problem-solving; strategic; social; and creative play. Shooter games, arcade-style games, and some puzzle games offer the active mode. Games that include physical space and travel offer the explorative mode. Games with problems and puzzles are connected with problem-solving mode. Games in which resources are manipulated in order to achieve a goal offer the strategic mode. Games that include interaction between players and characters offer the social mode. Creative mode of play is offered by games in which players create something or develop their characters'

appearance or skills. Most of the today's games fit into more than one category, some of them even fit into every category.

Sundqvist (2013) categorises games according to the number of players involved in simultaneous gameplay: singleplayer; multiplayer; and massively multiplayer games. Singleplayer games are played on one's own. Multiplayer games involve a minimum of two, and a maximum of around thirty players. However, there are some singleplayer games that offer a multiplayer mode. Massively multiplayer games involve hundreds, thousands, or more players in simultaneous gameplay. The more players in simultaneous gameplay, the higher the chance of communicating with other players. Therefore, massively multiplayer games offer a great platform for naturalistic L2 learning. Thorne, Black and Skyes (2009) stated that social virtual worlds and massively multiplayer online games comprise the most socially and cognitively complex forms of interactive media currently available.

8 METHODOLOGY

The following chapter presents a quantitative research conducted in 2018 in two primary schools in Zagreb, Croatia: Primary School Tin Ujević and Primary School Davorin Trstenjak. The results were processed in SPSS Statistics Version 20. Mainly descriptive statistics was used (frequencies, crosstabs). The aim of the research was to establish correlation between playing digital games and knowledge of English. Our hypotheses were that there is a positive correlation between playing digital games and students' knowledge of vocabulary, and the number of hours spent playing digital games and students' knowledge of gamning terminology and acronyms.

8.1 Participants

The participants in this research were fifty-five (N=55) 7th grade students, and their English language teachers (N=2). The students were 13 (N=48), and 14 years old (N=7). Twenty-seven of the students were female (N=27), and twenty-eight of them were male (N=28). Twenty-seven of the students attended Primary School Tin Ujević (N=27). Twenty-eight of the students attended Primary School Davorin

Trsetnjak (N=28). Permission from the headmasters of the schools and the English language teachers was obtained prior to conducting the research. The students' parents also had to sign an informed consent, allowing their children to participate in the research (Appendix 1).

8.2 Instruments

This research was carried out in two parts. The first part was in the form of a questionnaire (for teachers and students), and the second part was in the form of a test (Appendix 2). Before filling in the questionnaire, an agreement with the students and their English teachers was reached that demanded the students to sit in the same spot during the questionnaire and the test because they were given a numerical code (a random number from one to ninety-nine) according to the spot they sat in.

8.2.1 Teacher questionnaire

The purpose of the teacher questionnaire (Appendix 3) was to gain information about the teachers' habits of using technology in English language teaching and their opinion about the implementation of digital games into English language teaching. In addition to information regarding their years of experience, the questionnaire consisted of six questions. Three questions (questions 1, 2, 3) in the questionnaire examined the teachers' habits of using technology in English language teaching, and three questions (questions 4, 5, 6) examined their opinion about the implementation of digital games into English language teaching. Five questions were close-ended, and one was open-ended. Two questions were multiple choice questions (questions 1, 2). In the first question the teachers could circle only one answer, while in the second question they could circle more than one answer and had the ability to write additional information depending on the answer they had circled. Three questions (questions 3, 5, 6) were dichotomous, with possible answers being 'YES' and 'NO'. Question 6 also had an open-ended part of the question in which the teachers had to explained why they had circled 'YES' or 'NO'. Question 4 was designed as a five-level Likert scale.

8.2.2 Student questionnaire

The purpose of the student questionnaire (Appendix 4) was to gain information about the students' habits of playing digital games and their opinion about how playing digital games affects their knowledge of English. They also had to write the date, their numerical code, their age, their grade, and circle their gender. The questionnaire consisted of eleven questions. Seven questions (questions 1, 2, 3, 4, 5, 6, 8) in the questionnaire examined the participants' habits of playing digital games, and four questions (questions 7, 9, 10, 11) examined the correlation between playing digital games and knowledge of English. Ten questions were close-ended questions in which participants had to circle one or more answers. The participants could circle more than one answer in two questions (questions 3 and 9), and they could circle only one in the rest of them. Within the close-ended questions, the participants could write additional information depending on the answer that they had circled (questions 2, 3, 4, 5, 8, 9). Three questions were dichotomous (questions 1, 7, 11), with possible answers being 'YES' and 'NO'. If the students answered 'NO' to question 1 ('Do you play digital games?'), then the rest of their answers were not taken into account. Question 10 was designed as a five-level Likert scale. Question 6 was the only open-ended question ('Which digital games do you play?').

8.2.3 Knowledge test

Four weeks after the students had participated in the questionnaire, they took the test.. The test was adjusted according to the participants' answers to question 6 from the questionnaire. Three of the participants who had taken the questionnaire did not take the test because they were not present at school when the test was taken, meaning that fifty-two (N=52) students took the test. The purpose of the test was to examine students' knowledge of English words used in a digital game called 'Fortnite', and their knowledge of commonly used English gaming terms and acronyms. The words were taken from 'Fortnite' because it was the most played game among the participants. The participants had to write the date and their numerical code that they had been previously assigned. The test consisted of sixteen questions. Fifteen questions were close-ended in which only one answer was correct, and one question was open-ended. Every close-ended question was a multiple-choice

question in which the participants had to circle one of four answers for which they thought was correct. The first part of the test consisted of ten questions which tested the participants' knowledge of English words used in the game 'Fortnite'. Three questions (questions 1, 2, 3) were designed in a way that a word was written above four pictures, and the participants had to circle one picture for which they thought illustrated the meaning of the written word. Four questions (questions 4, 5, 6, 7) were designed in a way that a picture was shown next to four words, and the participants had to circle a letter (a, b, c, d) in front of the word that described the picture. Three questions (questions 8, 9, 10) were designed in a way that a definition of a term was written above four words, and the participants had to circle a letter (a, b, c, d) in front of the word whose definition was written above. The second part of the test consisted of six questions about English gaming terms and acronyms. Three questions (questions 11, 12, 13) tested their knowledge of English gaming acronyms, and two questions (questions 14, 15) tested their knowledge of English gaming terms. The questions were designed in a way that a definition of a term or an acronym was written above four words, and the participants had to circle a letter (a, b, c, d) in front of the word whose definition was written above. The last question (question 16) was an open-ended question "Which other acronyms and/or terms have you learned playing digital games?". The words from 'Fortnite': *potion, glider, campfire, pickaxe, bandages, chest, map, squad, bush, to boogie*. These words were chosen because they are frequently used in the game, however they are not as commonly used in the students' formal education. The terms and acronyms: *AFK, GG, PvP, lag, noob*. These terms and acronyms were chosen because they are specific for the online gaming culture, however they are not commonly used outside the gaming context.

9 RESULTS AND DISCUSSION

9.1 Teacher questionnaire

One teacher had six years of experience, while the other had twenty-one years of experience. Both of them stated that they often used technology in their teaching, that they think that they are open to new technologies in teaching, and that they think

their knowledge about the educational capacity of digital games is good. One teacher claimed that she thought that additional professional development is necessary for the implementation of digital games into English language teaching, while the other claimed that it is not. One teacher wrote that she used a computer, and a CD in her teaching, and the other wrote that she used a computer, a CD player, a smart board, a mobile phone, a projector, and a tablet. Both teachers agreed that it is possible to implement digital games into English language teaching, but only one of them explained her answer: "The implementation of digital games in English language teaching is not complicated (under the condition that technology and internet connection is available to teachers), and it is useful in many ways because it has a positive effect on the students' motivation and it allows faster consolidation of certain linguistic and grammatical material through many examples."

9.2 Student questionnaire

Based on this questionnaire, we were able to gain information about the students' habits of playing digital games and their opinion about how playing digital games affects their knowledge of English.

Table 5 The number and percentage of male and female students who play digital games.

			Gender		Total
			Male	Female	
Do you play digital games?	YES	N	27	23	50
		N %	96.4%	85.2%	90.9%
	NO	N	1	4	5
		N %	3.6%	14.8%	9.1%
Total		N	28	27	55
		N %	100.0%	100.0%	100.0%

Table 5 shows that the majority of the students (50 out of 55) play digital games. Out of 5 students who do not play digital games, 1 is male and 4 are female. This indicates that digital games are an influential medium in young learners' lives.

Out of 50 students who play digital games, 25 of them play them a on PC. But, only 7 out of those 25 students are girls, the rest 18 are boys. This can be explained by Salonius-Paster and Gelfond's (2005) observation that girls play digital games for

shorter periods of time than boys, and Corneille and Desment's (2016) claim that playtime in mini-games is shorter and that mini-games are often played on mobile phones, thus making mobile phones more appealing to girls, which was observed in this research as well because 16 girls and 10 boys play digital games on mobile phones. Playing digital games on tablets is more popular with girls too, 6 girls and 2 boys play digital games on tablets. Gaming consoles are slightly more popular with boys, 14 boys and 10 girls play digital games on gaming consoles. The most popular gaming console among the participants is PlayStation which is played by 20 of them.

Figure 1 and Figure 2 demonstrate the differences in playtime between boys and girls.

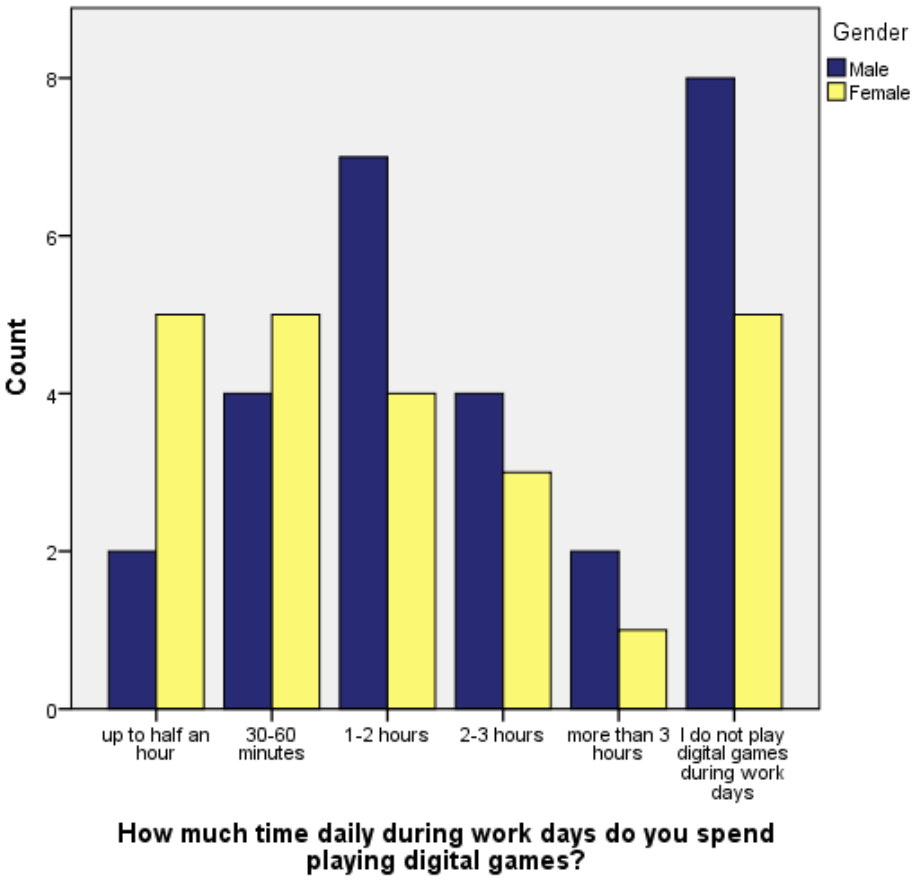

Figure 1 The amount of daily playtime of male and female students during work days

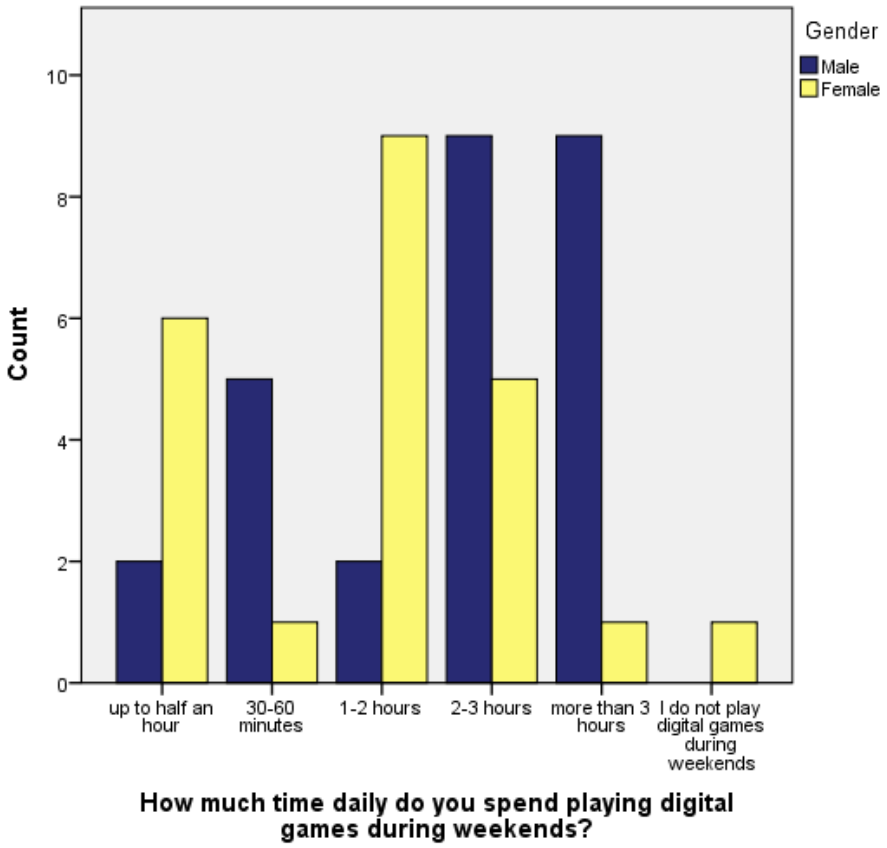

Figure 2 The amount of daily playtime of male and female students during weekends.

Figure 1 and Figure 2 confirm Salonius-Paster and Gelfond's (2005) claim that boys play digital games for longer periods of time than girls. More female participants play digital games up to half an hour, while more male participants play digital games for more than 3 hours. This difference is most obvious in Figure 2, where it can be seen that 9 boys compared to 1 girl play digital games for more than 3 hours during weekends. One male participant claimed that he played digital games 16 hours daily during weekends. However, he also stated that he was allowed to play for 16 hours a day during weekends. On the other hand, 8 students claimed that they played digital games during work days longer than they are allowed to.

There are 80 unique digital games played by 50 participants. The most played games are: 'League of Legends', played by 7 participants; 'Counter Strike', played by 7 participants; 'Call of Duty', played by 11 participants; 'Grand Theft Auto', played by 13 participants; and 'Fortnite', played by 20 participants. 'Fortnite' was the most played game among the students. 'Fortnite' is a digital game developed by Epic Games and People Can Fly. It was released in 2017 by Epic Games. What made this game so popular is its standalone mode called 'Fortnite Battle Royal' which is

free-to-play. The objective of the game is to survive longer than ninety-nine other players on the map. Two of the most common strategies to do that are hiding, and killing your opponents' avatars. Despite the violent gameplay, it is legal for children aged 12 and older to play the game. Like many games nowadays, 'Fortnite' is not a single-genre game, but it has many elements of a shooter game. It combines the elements of action games, adventure games, and strategy games. Out of those three, the elements of action games are prevalent in 'Fortnite', and, like in most action games, the environment within the game is not linguistically rich. According to deHaan's (2005) division of COTS games, 'Fortnite' is an action/adventure game, and as such is not beneficial for language learning. Sundqvist's (2013) game categorisation, on the other hand, suggests that 'Fortnite' is a great platform for naturalistic L2 learning because it can be defined as a massively multiplayer game. This research has shown that 'Fortnite' is more popular among male participants, as 14 of them were boys, and 6 were girls, which confirmed Kafai's (1996) observation that boys like more violent games, and that the current COTS games lean toward male audience.

When it comes to language learning, 42 participants think that they have learned English by playing digital games, while 8 of them think that they have not.

Table 6 The number and percentage of students according to who they ask for help from when playing digital games that are in English.

		N	N %
When I am playing digital games that are in English, I usually ask for help from:	no answer	1	2.0%
	parents	3	6.0%
	friends	1	2.0%
	older brother/sister	4	8.0%
	I try to understand/solve the problem in the game on my own	36	72.0%
	something else	5	10.0%

Most participants, 36 of them, try to understand/solve the problem in the game on their own rather then ask for help from somebody when they are playing games that are in English. Four out of five students who circled "something else" wrote that they also do not ask for help from anybody. This suggests that digital game players prefer

to be independent in understanding/solving problems while playing digital games, and, consequently, that they develop their inferencing skills which will be useful later in their lives.

Table 7 The number and percentage of students who claim to use, and not to use English for reading, writing, listening, and speaking.

When I play digital games, I use English for:					
		reading	writing	listening	speaking
YES	N	43	32	32	19
	N %	86.0%	64.0%	64.0%	38.0%
NO	N	7	18	18	31
	N %	14.0%	36.0%	36.0%	62.0%

Digital games that are in English demand the use of language skills. Most participants recognised reading as a skill they used while playing digital games.

Table 8 The number and percentage of students estimating their English language skills improvement caused by playing digital games.

		Reading	Writing	Listening	Speaking
No answer	N	1	1	1	1
	N%	2.0%	2.0%	2.0%	2.0%
It has not improved at all	N	2	3	2	6
	N%	4.0%	6.0%	4.0%	12.0%
It has improved slightly	N	4	4	4	2
	N%	8,0%	8.0%	8.0%	4.0%
I do not know	N	13	12	13	14
	N%	26%	24.0%	26.0%	28.0%
It has improved	N	20	16	12	13
	N%	40%	32.0%	24.0%	26.0%
It has improved significantly	N	10	14	18	14
	N%	20,0%	28.0%	36.0%	28.0%

Surprisingly, the participants did not recognise the biggest improvement caused by playing digital games in their reading skills, but in their listening skills. According to the students, 34 of them noticed an improvement in their reading, writing, and listening skills, but 18 of them noticed a significant improvement in their listening skills, while 14 of them noticed significant improvement in their writing skills, and 10 of them noticed an improvement in their reading skills. It was not surprising that the least number of students, 29 of them, noticed an improvement in their speaking skills, which consistent with the fact that only 32% of them claim to speak English while playing digital games.

Interestingly, only 60% (N=30) of the participants stated that playing digital games in English motivates them to learn English, which indicates that simply playing a game might not be enough to maintain interest in learning a language. Therefore, in the context of language learning, digital games are not as potent if they are not used in a meaningful way.

9.3 Knowledge test

Based on this test, we were able to gain information about the connection between the students' habits of playing 'Fortnite' and digital games in general, and their knowledge of words used in 'Fortnite' and commonly used English gaming terms and acronyms.

Table 9 The mean of the students' tests scores depending on whether they play Fortnite or not.

	Mean		
Do you play Fortnite?	Score (Fortnite)	Score (gaming terms and acronyms)	Score (total)
YES	9.85	4.45	14.30
NO	8.41	3.28	11.69
Total	8.96	3.73	12.69

The maximum number of points on this test was 15. Out of those 15 points, the maximum number of points in the part that tested the knowledge of English words used in 'Fortnite' was 10, and the maximum number of points in the part that tested the knowledge of commonly used English gaming terms and acronyms was 5. Every

right answer to a question, gave the participant one point. On average, students who play ‘Fortnite’ scored 14.30 points, 9.85 of which were from the questions regarding the knowledge of words from ‘Fortnite’ and 4.45 were from the questions regarding the knowledge of commonly used English gaming terms. They proved to be better than the students who do not play ‘Fortnite’ because they, on average, scored 11.69 points, 8.41 of which were from the questions regarding the knowledge of words from ‘Fortnite’ and 3.28 were from the questions regarding the knowledge of commonly used English gaming terms. Out of 20 students who are ‘Fortnite’ players, 18 of them solved every ‘Fortnite’ related question right, 15 of them solved every question related to gaming terms and acronyms right, and 13 of them solved all questions right. Out of 32 students who are not ‘Fortnite’ players, 10 of them solved every ‘Fortnite’ related question right, 9 of them solved every question related to gaming terms and acronyms right, and 7 of them solved every question right. Judging by the results, there is a positive correlation between playing ‘Fortnite’ and the success on the test.

Table 10 and Table 11 demonstrate the connection between time spent playing digital games on a daily basis during work days and during weekends, and the score in the part of the test with questions regarding the knowledge of commonly used English gaming terms.

Table 10 The mean of the students’ gaming terms and acronyms related questions tests scores depending on how much time daily during work days they spend playing digital games.

		Score (gaming terms and acronyms)
		Mean
How much time daily do you spend playing digital games during weekends?	up to half an hour	1,75
	30-60 minutes	3,20
	1-2 hours	4,30
	2-3 hours	4,23
	more than 3 hours	5,00

Table 11 The mean of the students' gaming terms and acronymss related questions tests scores depending on how much time daily during weekends they spend playing digital games.

		Score (gaming terms and acronyms)
		Mean
How much time daily during work days do you spend playing digital games?	up to half an hour	3,14
	30-60 minutes	3,29
	1-2 hours	4,50
	2-3 hours	4,57
	more than 3 hours	4,67

The average score increases as the time spent playing digital games increases, with the exception of the scores in Table 10 where the students who play for 1-2 hours during work days have achieved a better result than the students who play for 2-3 hours during work days.

In the last question, the participants were supposed to list the acronyms and terms that they had learned playing digital games. They listed 47 different acronyms, and 10 different terms.

Gaming acronyms: JG, ADC, LOL, LMAO, LMFAO, STFU, AR, SMG, KYS, IRL, JK, CPU, BRB, HRU, MOBA, FPS, ADS, WP, GLHF, GH, BG, EZ, MLG, PvE, OMG, WTF, WYN, GJ, GTG, GGWP, WP, MMORPG, MMO, TBA, ATM, NPC, FP, M8, G2G, NP, ASAP, FTW, FF, SS, XP, HP, DMG.

Gaming terms: Watch my 6, glitch, pro, rookie, lag switch, patch, bug, nerf, ban, dinked.

These gaming acronyms and terms can be divided into three categories: 1) acronyms and terms that can be used outside gaming context, e.g. LOL, LMAO, pro; 2) acronyms and terms that are mostly used in gaming context, e.g. WP, GLHF, nerf; 3) acronyms and terms that are connected to a specific game, e.g. ADC, JG, dinked. Therefore, the students can use the language that they have acquired while playing

digital games, both inside and outside of the gaming context. On the other hand, some terms and acronyms can be understood only by gamers, or players of a specific game. This indicates that the broadness of the students' vocabulary might not always be obvious.

10 CONCLUSION

Technology is advancing at a rapid rate, and because of its influence on our lives we have to adapt. Teachers have been using technology for educational purposes since the last century, but it is getting more difficult to keep up with the newest technological achievements. Digital games are a medium that has appeared as a consequence of technology. Despite their complexity, if they are used properly in an educational context they can increase the motivation of the students and facilitate learning. The most important factor in implementing digital games into teaching are the teachers themselves. More specifically, their knowledge about digital games, and their willingness to implement them into their teaching. Teachers should be aware that digital games are a potent medium for acquiring a foreign language, and because most commercial games are in English, they are especially potent for acquiring English language. The research in this paper showed that most participants, who are young learners, play digital games. It also showed that the participants who were exposed to vocabulary from the game 'Fortnite' by playing the game, scored better on the knowledge test, and that the longer the participants played digital games, the better they scored on the part of the knowledge test regarding gaming terms and acronyms. This is how language acqusition occurs anyway - the more exposed they are the better and faster children learn. Digital games are so advanced today that all language skills can be used by playing them. However, if digital games are used for educational purposes their focus has to be on the learner's progress, not just gameplay. Secondly, knowing that students play games can help the teacher determine the students' langauge/linguistic backgrounds, potential and interests and adequately introduce gaming or the langauge of gaming into lessons. The teacher can ask students to write down the language they have used, or describe situations in a game, have them introduce some accrronyms in the classroom – make projects,

presnetations, posters, explore the language of games in different sitautions/contexts... Thirdly, even though the knowledge of one's language might broaden with time spent playing digital games, educators, parents and players have to be aware that playing games is not the only way of learning and encourage students to explore and experience learning in many aspects. Here, we primarily emphasize the downside of playing games for longer periods of time. Language learning happens while playing digital games, gamers can acquire all aspects of a foreign language through gaming, not just vocabulary, and gaming acronyms and terms as shown in this paper. Learning English through gaming is not only the future, it is the reality. Both teachers and parents should be aware of that, for it is up to them how this relatively new medium will be used or misused.

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APPENDICES

Appendix 1

Učiteljski fakultet Sveučilišta u Zagrebu
Savska cesta 77, 10 000 Zagreb

Poštovani roditelju,
u svrhu pisanja diplomskog rada zamolio bih Vas za pristanak glede sudjelovanja Vašeg djeteta u istraživanju.

Tijekom sata Engleskoga jezika učenici će sudjelovati u istraživanju. Cilj istraživanja je ispitati stajališta učenika o igranju digitalnih igara i utvrditi postoji li povezanost između njihovih navika igranja digitalnih igara i njihovog znanja engleskog jezika. Istraživanje će se provesti u dva navrata. Stavovi i navike učenika prema igranju digitalnih igara ispitat će se anketnim upitnikom. Znanje engleskog jezika, odnosno poznavanje često korištenih engleskih pojmova u digitalnim igrama, ispitat će se kratkom provjerom znanja (10 minuta).

U diplomskom radu se nigdje neće spominjati ime Vašeg djeteta već će se gledati ukupni podatci.

S poštovanjem,
Petar Krešimir Jurenec
student 5. godine Učiteljskog fakulteta u Zagrebu.

Potpis roditelja: _____

Appendix 2

KNOWLEDGE TEST

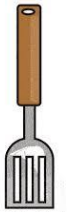
Dear students, this test tests your understanding of the terms used in digital games. Read everything carefully and answer the questions. If you have any questions, feel free to ask. Thank you!

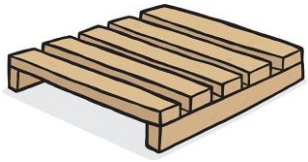
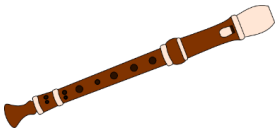
Date: _____

Code: _____

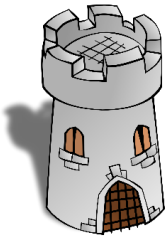
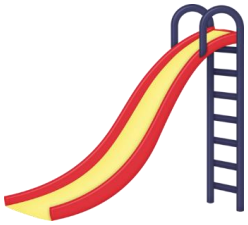
Circle the picture which show the written term.

1) POTION



2) GLIDER


3) CAMPFIRE




Circle the letter in front of the word that describes the picture.

4) 

a) pickaxe

b) entry

c) assumption

d) hatchet

5) 

a) spleens

b) bandages

c) fractures

d) wipes

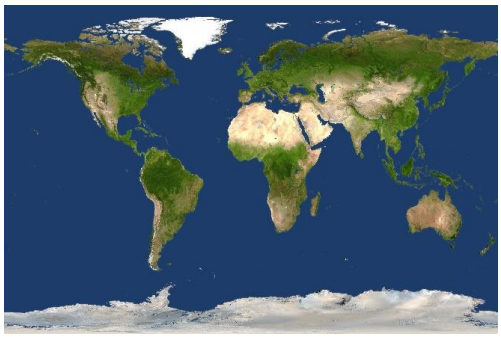
6) 

a) screen

b) board

c) soil

d) chest

7) 

a) register

b) map

c) cart

d) foundation

Circle the letter in front of the term that is defined.

8) A small group of people trained to work together as a unit.

a) currency

b) squad

c) storage

d) infant

9) A plant with no main stem which grows from the ground, it is usually covered with green leaves, and it has a round shape.

a) layer

b) oak

c) chart

d) bush

10) To dance to pop music.

a) to boogie

b) to vex

c) to fling

d) to bid

11) An acronym that is used during a game when a player is away from the computer.

a) WTG

b) ATM

c) KIK

d) AFK

12) An acronym that is most commonly used at the end of a game when a player is satisfied with the game.

a) JK

b) RL

c) AA

d) GG

13) An acronym that is to stress that players play against each other in a digital game.

a) NpC

b) BoE

c) PvP

d) AoE

14) A term describing delays and pauses in a digital game because of problems with the internet connection.

a) aggro

b) patch

c) lag

d) craft

15) A term describing a bad or less experienced gamer.

a) foozie

b) baddie

c) playa

d) noob

16) Which other acronyms and/or terms have you learned playing digital games?

_____

_____

Appendix 3

TEACHER QUESTIONNAIRE

Dear teacher, in this questionnaire, you will be asked a series of questions about the use of technology and digital games in English language teaching, for the purpose of writing a master's thesis. Please answer every question. Thank you.

Years of experience: _____

1) How often do you use technology in your teaching?

a) I do not use technology in my teaching

b) I rarely use technology in my teaching

c) I sometimes use technology in my teaching

d) I often use technology in my teaching

e) I use technology every lesson

2) Which technological device do you use in your teaching?

a) Computer

b) CD player

c) Smart board

d) Mobile phone

e) Other

Which? _____

3) I think that I am open to new technologies in teaching.

YES NO

4) I think that my knowledge about the educational capacity of digital games is:

Very bad	Bad	Mediocre	Good	Very good
1	2	3	4	5

5) I think that additional professional development is necessary for the implementation of digital games into English language teaching.

YES NO

6) I think that it is possible to implement digital games into English language teaching. Why?

YES NO

_____

_____

_____

_____

_____

_____

_____

Appendix 4

STUDENT QUESTIONNAIRE

Dear students, in this questionnaire, you will be asked a series of questions about your habits of playing digital games and their influence on your knowledge of English, for the purpose of writing a master's thesis. Read everything carefully and answer the questions. If you have any questions, feel free to ask. Thank you!

Date: _____

Code: _____

Gender (circle): M F

How old are you? _____

Grade: _____

1) Do you play digital games?

a) YES
b) NO

2) How much time daily during **work days** do you spend playing digital games?

a) up to half an hour
b) 30–60 minutes
c) 1–2 hours
d) 2-3 hours
e) more than 3 hours (how much?) _____
f) I do not play digital games during work days

3) How much time daily do you spend playing digital games **during weekends**?

a) up to half an hour
b) 30–60 minutes
c) 1–2 hours
d) 2-3 hours
e) more than 3 hours (how much?) _____
f) I do not play digital games during weekends

4) I play digital games on: (you can circle more than one answer)

a) PC

b) Gaming console (PlayStation, Xbox…)

Which one? _____

c) Some other device (mobile phone, tablet…)

Which one? _____

5) How much time daily (during work days) are you **allowed** to play digital games?

a) I am not allowed to play digital games

b) up to half an hour

c) 30-60 minutes

d) 1-2 hours

e) 2-3 hours

f) more than 3 hours (how much?) _____

g) as much as I want

h) I am allowed to play only during weekends (how much?) _____

6) Which digital games do you play?

_____

_____

7) I think that I have learned English by playing digital games.

a) YES
b) NO

8) When I am playing digital games that are in English, I usually ask for help from:

a) parents
b) friends
c) older brother/sister
d) I try to understand/solve the problem in the game on my own
e) something else:_____

9) When I play digital games, I use English for:

a) writing
b) reading
c) listening
d) speaking
e) something else: _____

10) Do you think that your English language skills have improved because of your playing digital games? Circle one number in each row.

	It has not improved at all	It has improved slightly	I do not know	It has improved	It has improved significantly
Reading	1	2	3	4	5
Writing	1	2	3	4	5
Listening	1	2	3	4	5
Speaking	1	2	3	4	5

11) Playing digital games in English motivates me to learn English.

a) YES
b) NO

Izjava o samostalnoj izradi rada

Ja, Petar Krešimir Jurenec, student Učiteljskog fakulteta Sveučilišta u Zagrebu, izjavljujem i svojim potpisom jamčim da sam samostalno istražio literaturu, proveo istraživanje i napisao diplomski rad na temu: LEARNING ENGLISH THROUGH GAMING.

Zagreb, srpanj 2018.

Potpis studenta: _____