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Video game play as a meaningful online social activity – a virtual zone for integrative L2 learning and practice

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The video game play provides meaningful social interactions through which the participants' vocabulary can frequently benefit because it utilizes both implicit and explicit learning occasions. The play carries phrases, necessity of communication and task completion where there is an emerging opportunity of integrative learning. Grammar may be deduced from practicing sentence patterns which thus can be anchored into one's lexicon. Following the latest research data, we attempt to find an answer to which type of video game presents an effective environment for vocabulary acquisition. In our study, we compared 646 video gamer students from five Hungarian secondary schools who completed a receptive vocabulary levels test. It was proven that the action video games have the most significant effect on the participant's lexical advancement.

Keywords: *implicit and explicit learning, integrative learning, communicative games, incidental vocabulary acquisition*

1. Introduction

The most important motivating factor to play video games is the opportunity of executing actions which are impossible to perform in reality (Sherry et al. 2006), because the virtual reality games provide the opportunity to encounter the wished world with the feeling of residing in a realistic but created sphere with its own rules (Slater 2006). Games with formal rules are usually starting with verbal or written instructions and it can be passed along from one gamer group to another. All plays are social and by taking part students learn how to get along with others by co-operating with rules (Vigotsky 1978), that is why games are democratic. According to Huizinga's 1955 Homo Ludens, playing is a free activity and the player can be absorbed into it intensely and completely, which Csikszentmihalyi (1996) calls flow.

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The play also has attributes, namely, no material interest or profit is involved. In play children must decide what to do, go along with a plan and solve any problems which arise along the way. It is characterised as intrinsically motivated and focused on means rather than its end, distinct from explanatory behaviour, nonliteral, free from external rules, actively engaging the players (Rubin, Fein and Vandenberg 1983) a description which was completed by Gray by 'Play is activity that is (1) self-chosen and self-directed; (2) intrinsically motivated; (3) guided by mental rules; (4) imaginative; and (5) conducted in an active, alert, but relatively non-stressed frame of mind' (2013: web).

In real life, humans opt for the least effortful way to achieve their goal. In games, the longer the better, because the attention for the means is greater than that for the ends. The primary objective of play is to get hold of the object which the participant does not possess. Competitive play is directed toward the goal of scoring points and winning. The educational power of games is in its triviality, and it is ideal to practice new skills, try out new ways of doing things because play has no real-world consequence, besides nobody is judging, so the player is free to fail, which is equivalent to freedom to experiment. Experiencing failure provides also the capacity for feedback from which a virtuous circle of learning can be initiated, besides it is a safe and fun place to practice (Gray 2013). Games are highly repetitive, because of the recurring motion pattern of the fingers on the controller, thus it supports the development of the motor cortex for locomotion as well as for the muscles that are involved.

The action video games particularly challenge the abilities of the participants, which is constantly indicated by successful or failing combat situations as immediate feedback. On the one hand, the successfully completed tasks show the gamer' advanced abilities; meanwhile, the as failures reveal if a gamer's abilities do not match to the challenges of the tasks. The active confrontation of the enemy initiates new game events which are defined moments of high game occurrence that require effective control and focus. The emotional and attentional processes signify in cognitive and sensorimotor systems, besides the implication of midbrain reward system, that structures reflect enjoyment and positive game experience (Klashen et al. 2012), although the gamer experiences hardships, thus the reward might be postponed (Borderie and Michinov 2016).

Language has rules similar to the rules of play, like morphology, syntax and phonology, so speaking is also rule based, nevertheless a free and creative activity (Lewis 2003). The player is also interested in creating new characters in a game, where usually age groups can be mixed, thus the elders can teach the young how to play a game, thus providing an opportunity for people to socialize in order to observe cultural innovations, like new words or perceive accents or diglossia

(Arnold-Stein and Hortobágyi 2021). Encountering and acquiring new words are valuable for cognitive development, because paying attention, remembering and thinking ahead are all elements of intelligence (Gray 2017). Having developed all social, cognitive and linguistic comprehension, an individual also feels the motivating effect of the aim of winning.

2. The Nature of implicit and explicit learning

The implicit and explicit systems are two information processing systems which acquire, memorize, and represent knowledge. The declarative/procedural model is widely applied in language acquisition and second language learning (Ullman 2001). The implicit system is experience-based, or a form of unconscious, incidental, and procedural knowledge, thus its content is not verbalizable and can only be transferred into task performance, whereas the explicit system is rule-based, or a form of intentional, conscious, and declarative process, thus its content is verbalizable and can be accessed through conscious awareness (Dienes and Perner 2002). Therefore, the most common scenario is that learning engages both systems simultaneously in order to apprehend the complete action or knowledge thoroughly to be practicable and later to be retrievable.

2.1. First language acquisition

First language acquisition begins in early childhood favourably in infancy and it depends thoroughly on the implicit learning because it is non-conscious, the toddler recognises objects and subjects e.g., the parents assign them basic verbal patterns to identify objects and feelings (Yang and Li 2012). Through listening and practicing, the toddler deduces more and more speech patterns which s/he tries to mirror. During an early period, the child mispronounces words and the parents usually do not attempt to fix such mistakes, just later, around the pre-schooler ages when the explicit learning of the declarative knowledge learning time is to be initiated and the child requires the proper pronunciation consciously. Later, the peer-play can activate the atmosphere in which the implicit (acquisition of the procedural knowledge) and the explicit learning (acquisition of the declarative knowledge) are the most effective. Declarative learning mostly happens during late or adult language learning in instructional (school) settings. In L2 learning the individuals have diversified grammar information, which is represented explicitly, thus the grammar they want to apply may be adequate, so the learners need volitional control, "…because of the predication explicitness of the representations

formed during learning." (Dienes and Perner 1999, 752). Meanwhile most types of implicit knowledge are composed of characterisation, which solely reflects the attributes of objects or occasions without predicating them in any special linguistic unit. However, after a long immersion into the native speakers' environment, extensive practice can facilitate building representations in the implicit system, the so-called internalizing, the language(s) mostly display an overlapping of both systems (Dietrich 2004).

2.1.1. The Importance of adult-child Interactions and play

In order for children to establish their linguistic and non-linguistic devices the interactive episodes may help to determine the parent's attentional focus and hence the meant language reference. Having determined the functional significance of language, like its primary function and object labelling, learning is based on the way parents use language in the environment of the child. Thus, balanced social interactions and object labelling occurrences are crucial to the child's vocabulary acquisition and subsequent linguistic development. Tomasello and Farrar (1986) conducted research about joint attention, in which the adult-child interaction has a common focus, and the produced non-linguistic context predetermines the conversational material, the child's attentional focus is established, and the child can utilize the recognized object-names. The increasing amount of adult-child joint attention induces a virtuous circle in which the child's actual idiomatic attention turns towards novel objects and their labelling. Besides, during joint attention courses the mother and child dyad talk more and are engaged in longer dialogues, which facilitates the development of the child's linguistic competence, because the mother starts her utterance when the child also focuses on the same object. The object reference type impacts the child's vocabulary acquisition, such as playing, which is a powerful vehicle to carry various types of stimulating object references, through their persuasive nature. Furthermore, the follow-in method provides a certain amount of language production, like in playing sessions, when word learning is maximal as well as the emergence of novel linguistic structures. Playing is equally a powerful vehicle, because the child is attentive, motivated and the way of establishing the meaning of the mother's language is effortless (Tomasello and Farrar 1986).

2.1.2. Preschool play

Preschool play comprises 30% more vocabulary items than parent-child occasions, which can be rightfully considered as evidence of how employing play for instructional teaching can yield optimal vocabulary and cognitive development. In the preschool period play - as an enhanced milieu in teaching (EMT) - can facilitate

the correct responses from children, which are thus reinforcing the results of acquisition. Acquisition of specific target words through naturalistic play based on EMT strategies is coupled with book reading to introduce words. At school age research has found that 7-12 exposures to individual words are necessary for a generative use of an expression (Nagy 2005). During playing the items of the receptive vocabulary can be ideally associated with novel words that carry multiple contexts and instances, such phenomenon is considered to be the best practice in vocabulary acquisition in early childhood (Harris et al. 2011).

The balance of the explicit and implicit processing systems is used to acquire, to memorize and to represent knowledge (Sun 2001), therefore learning takes place by the "…hierarchical development of cognitive functions where an increase of integral structures continues to increase the level of complex processing" (Gold and Ciorciari 2020, 5). Intended actions belong to explicit knowledge thus they are conscious, whereas automatic actions are part of the implicit knowledge, which can remain unconscious.

2.2.1. Implicit and Explicit Error Correction as Integrative Learning Experience

Every kind of learning requires complex stimuli with/out conscious awareness. In second language acquisition, as Krashen's theory of second language acquisition claims, learners' acquisition is unconscious, which requires comprehensive input, low anxiety situation and willingness to communicate (Krashen 1988) among others. Meanwhile, learning is a conscious activity and requires knowledge about the language in order to monitor the grammatical understanding, which acts as a correction function. The correction involves 3 essential conditions, such as knowing the rule, focusing on the form and having sufficient time (Schmidt 2001). The explicit learning of grammar is in line with e.g., Ullman's (2001) second language learning approach. Therefore, we can speak about the presence of both second language acquisition to some extent and language learning, which together lead to the ultimate question, what is the proportion of the explicit and the implicit nature of L2 learning?

Explicit correction means providing the learner with direct forms of feedback by directing the attention of the learner to the incorrectness. Implicit correction is the process of providing the learner with indirect forms of feedback by which the learner inferences the nature of the inaccuracy. The explicit corrections were more meaning-based than the implicit ones, although the learner may not interpret the implicit feedback negatively, the student might notice it only as the teacher simply wishes to help the flow of communication, which thus can facilitate the willingness to communicate. Therefore, attention is crucial in language learning (Schmidt 2001) and the metalinguistic awareness can cause better performance of the explicit corrections, supported by the findings of Varnosfadrani and Basturkmen (2009)

who argue that the explicit error correction is more effective, because it raises awareness of the accurate form, meanwhile the implicit rectification contains the nature of the correct form by which the usage pattern can be inferred. The conclusion of the same paper also promoted that the mixed feedback is the most favourable, because it serves both types of learners. Incorporating both explicit and implicit error correction in the same activity allows activating an integrative learning experience because the conscious correction adds some extra sense to which the pure practice does not.

2.2.2. Monitoring the Communication Flow

Communication as information circulation becomes automatic or flow like while participants are deeply immersed in conversation, although the accuracy and fluency errors must be corrected before they are formed into habits. Thus, in language learning the feedback actuates the person's own monitoring with regard to accuracy and performance, which raises the question of finding which circumstances of a setting facilitate most the monitoring activity. Therefore, the environment strongly influences show the error correction ought to be made e.g., in instructional language learning events the interruption of the communication flow is inherent, especially when the teacher implies the mistake explicitly. Yet, even in instructional circumstances the teacher attempts to use the most continuative and effective manner of error correction without the least interruption of the upbuilt language knowledge, usage and self-confidence as the error correction is one of the most crucial points of language learning. The circumstantial opportunities must be exploited fully, knowing that the implicit feedback is non-interruptive, and that this makes it more difficult to identify the corrective intent behind it (Long 2007), while interruptive by nature, the explicit feedback is accurate and makes it easier for learners to recognize the fault (Carroll 2001).

2.2.3. The Potential of the Negative Feedback

The negative feedback affects the learner's competence and knowledge, e.g., Long (2007) argues that negative feedback has potential for influencing learner's language competence and has a significant effect on L2 acquisition. The feedback types can also be differentiated by nature, for example how much metalinguistic information they mediate or how directly they can convey such information. The tutor's feedback moves, or the other influential circumstances are important in order for the student to be able to comprehend more metalinguistic material and produce more uptake (Yilmaz 2013) or intake (Krashen 1988). As research on this issue has revealed, the explicit and mixed feedback proved to be the best method of the error correction (Yilmaz 2013).

3. Video Game Play and Language Learning

3.1. Implicit / explicit learning? exposure? instances at video gaming

The key to the gamer's success in video games is the implicit and the explicit knowledge acquisition which happens through failures or peer feedback. For instance, the sequential failures reveal if a gamer's abilities do not match the challenges of the tasks, which implicitly means that one of the gamer's abilities is not up to the difficulty of the game level, although the gamer must find out explicitly what should be improved. This includes remapping the prior actions to discover the exact origin of the failure. Explicit learning rests more heavily on conscious awareness and attentional control, meanwhile implicit learning does not, which means that the implicit learning phase may facilitate the flow state, which, in turn, frees up working memory capacity and makes the incidental acquisition more successful (Dietrich 2004). Implicit learning also occurs when the rules are deducted by the knowledge of similar games. The rules are learned explicitly by carefully studying the written rules and by peer explanations, who can provide error correction verbally, thus through language usage. The participants of video games are expecting error correction occurrences naturally and curiously, either instance can be applied depending on the player's readiness (Schmidt 2001).

The language exposure is continuous while playing a video game, therefore the possible intake can be powerful, motivating and will contain metalinguistic information to some extent. As attention is crucial in language learning (Schmidt 2001), metalinguistic awareness can cause better performance with the explicit corrections (Varnosfadrani and Basturkmen 2009). The rules of the games contain vocabulary and grammar rules of the target language, which can be integrated into the participant's interlanguage. In video gaming there is a strong possibility to meet both explicit and implicit language correction in action, because of the situational inference and there is also a probability of peer correction (MMORPG/MOBA). Besides, if a video gamer cannot incorporate the correct form at once, then the gamer has to return to the beginning of the incomplete level and start again or in case of MMORPG/MOBA games the gamer will not be selected for next play, as a result the participant will understand the importance of precise language use. During gaming in action there is no time for error correction, this is possible mostly in idle times with the help of a better gamer in the same room who can help with a quick written message. We know that gamers are much more aware of the language of a particular game and attempt to avoid confusing linguistic errors, because of the rapid nature of the activity.

The controller usage requires mostly implicit knowledge, although due to the nature of the video games they can provide occurrences which can generate a transition between the implicit type of knowledge representation into the explicit representation (Wessel, Haider and Rose 2012). The existence of such a transition means that the gamer is able to report or 'verbalize' a sequence pattern or even to finger movements which can be done through verbal explanation. Interpreting implicit knowledge by words is part of the accurate practice because thorough verbalisation requires an extended language usage. Following Carroll's thought, the explicit correction used in his study included explicit verbal indicators (i.e., *It is wrong, you should say that.),* which is in line with the peer conversations in interactive (MMORPG, MOBA etc.) video games where the participants initiate the corrective intent saliently because it is relevant to their ongoing game (Carroll 2001).

Almost all kinds of video games contain occasions of implicit patterns, like places of expectable attacks or clearly akin strength and attributed of dissimilar figures or situations, sequence of actions at a game level or even between game levels, information which may led to recognising a certain, occasionally predictable sequence and helps the gamer to complete the level by providing evocative hints. From a linguistic point of view, the verbalisation promotes evoking sentence chunks and patterns by practicing them when the gamer explains the occurrence to a peer, in addition, all the game figures, places and actions have names and attributes to describe, which provides innumerable nouns, adjectives and verbs for vocabulary expansion. Consequently, video games may provide mixed feedback thus video gamers can benefit from any kind of correction response depending on the type of game. Besides, the video gamers possess and watch game streaming, gamer podcasts and one to one verbal conversation sessions in chat rooms where anybody can comment on which sentences can be used as language recast that works as a recurrent discourse device. A recast occurs when a communication partner repeats something that a gamer says with more detailed language, or more correct language, e.g., '*treasure box*' and the moderator or peer responds in a more detailed manner, '*Yes, the treasure is in the box'*.

3.2. English in gaming

When students are asked about prior experience with digital media for language learning strategies and digital game playing behaviours there are always significant amounts of respondents confirming their positive attitude towards interactive digital activity. This is more salient with regard to learning English, because the digital media uses English extensively, thus its usage may be beneficial to the learners' perceived English language skills as well as to its practice (Gee 2007). The

mobile assisted language learning is available everywhere even in classroom set-ups, because of their linguistic and motivational aspects (Burston 2014). Interestingly, Blume (2019) did not find video gaming as frequent (30%, among 1-13 graders) in the researched population of Germany, although they use English applications to assess they own linguistic strategies. Students who play games, regardless of language, tend to rate their skills slightly higher than those who do not play. A positive correlation between game playing frequency and perceived usage of language learning strategies was found, almost 60% of the responders believe that digital game-based language learning (DGBLL) (Dixon and Christison2021) is useful, easy to use, and it carries valuable and updated English vocabulary. DGBLL seems to be negligible although teachers hold positive beliefs regarding DGBLL, likewise the actual gaming behaviours correlate with perceived language learning strategies in school. However, the author found a negative correlation between the usage of digital games and digital media in teaching because the accessible games and ostensive devices do not match the students' actual stimulating demands.

4. Study

4.1. Participants, Methods

In order to reveal which type of game has the most influential effect on vocabulary development, we conducted a two-part cohort survey. We conducted quantitative research, because we expected more than 500 respondents with the cross-sectional cohort survey, with two consecutive samplings; the aim of the first sampling was to define the video gamers as an experimental group and the non-gamers as a control group, then we were able to run the vocabulary level tests (VLT) on both groups. The participants were 890 Hungarian secondary school students, aged 14-20 and as such ranging between 9-13 graders. Both surveys were run online and anonymously. Having validated the results, the non-gamer group consisted of 244 students, which equals 27.5% of the participants, and the video gamer group comprised the vast majority, altogether 646 students, which is 72.5% of the participants. However, these video gamers were distinguished by the fact that they are by playing *any* kind of video game on a daily basis from the hard-core gamer to the soft-core gamer. The players are only differentiated by the number of hours played per day, the quality and the type of their gadget and games they play, factors which were requested and recorded as variables. We used SPSS 25 for the statistical calculations.

4.2. Research Questions

Our main research question was:

What type of game contributes more to the VLT test results?

The research question was formulated based on the following hypotheses:

- There are communicative video games in which the player must react to the peers' requests as well as he must inform or instruct them.
- These games use a greater range of the English vocabulary verbally.
- The less communicative games use English words to a great extent also, but the player is usually just a receiver of the information.
- Consequently, the more communicative games can contribute more to the development of vocabulary knowledge, which can be measured by VLT. It is also important to know that in the cohort there is no video gamer who plays only one type of game.

4.3.1. Correlations

In favour of answering our research question we correlated the participant's results in VLT with their favourite type of games (see Figure 1.). The Spearman's rho correlation (see Figure 1.) was used with a one-tailed analysis, because we hypothesized that the more communicative video game types positively influence the participant's test results. Participants' VLT test results correlated significantly with all video game types e.g., Open world r = .30, first person shooter (FPS) r = .29, third person shooter (TPS) = .24, battle royale r = .23 (BR), although card games r = .15, puzzle and board games r = .15 correlate less significantly. Whereas the virtual reality games (VR) were insignificant in correlation with participants' VLT test results r = .07, all p < .001.

Test	Open World[a]	FPS[b]	TPS[c]	B.R.[d]	MOBA[e]	MMORPG[f]	Adventure[g]	Sports[h]	S.M.[i]	Platformer[j]	Card[k]	Puzzle, board[l]	VR[m]
Participants' results in VLT	.306**	.298**	.242**	.238**	.222**	.214**	.212**	.196**	.187**	.166**	.159**	.159**	.070
Sig. (2-tailed)	.000.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.125
N	646	646	646	646	646	646	646	646	646	646	646	646	646

Figure 1. Spearman's rho correlation coefficients between VLT test results and dependent variables

Note.
Multiplayer mode available, *participants can communicate verbally (through Discord),* co-op mode available

a). *Open World,* e.g., ***GTA***, **Minecraft**, ***Red Dead Redemption (online)***, **Mafia Series**
b). *First Person Shooter*, e.g., ***Call of Duty***, ***Battlefield Series***, Metro 2033, **Dusk**, **Doom**, ***Paladins***
c). *Third Person Shooter*, e.g., Hitman, ***Tom Clancy's Division***, ***Warframe***, **Sniper Elite**
d). *Battle Royale*, e.g., ***PUBG***, ***Fortnite***, ***Apex Legends***, ***Counter Strike: Global Offensive***
e). *Multiplayer Online Battle Arena* e.g., ***League of legends***, **Dota 2**, **Heroes of the Storm**, **Smite**
f). *Massively Multiplayer Online Role-Playing Game* e.g., ***Word of Warcraft***, **Metin 2**, **Tera**, **Star Wars: Old Republic**
g). *Adventure,* e.g., **The Walking Dead** (Telltale), **Tomb Raider Series**, **Life is Strange**, Beyond: two souls
h). *Sports,* e.g., FIFA, NBA, NHL, Football Manager Series, Tekken Series, F1, Moto GP
i). *Social Media*, e.g., Cat Mario, Farmerama, Candy Crush Saga, **Forge of Empire**, **Farmville**
j). *Platformer,* e.g., Mario Series, Cuphead, **Rayman Series,** Inside
k). *Card,* e.g., **Hearthstone**, **Yu-Gi-Oh! Legacy of the Duellist**, Gwent, **Artifact**
l). *Puzzle and Board,* e.g., Portal II., **Guitar Hero**, Untitled Goose Game, **Knowledge is Power**, Jewel Quest
m). *Virtual Reality*, e.g., Superhot VR, Resident Evil VII, **Beat Saber**, Moss, Tetris Effect

∗ Correlation is significant at the 0.05 level. ($p \leq 0.05$; 2-tailed)
∗∗ Correlation is significant at the 0.01 level ($p < 0.01$; 2-tailed)

4.3.2. Regression

The regression summary (see Figure2.) $R^2 = (.362)^2 = .113$, which means 11.3 % contribution of these games to the VLT test results, is in line with our previous findings, because we had almost the same outcome (10.3%) when we had correlated the video gamers and non-gamers with their VLT results, although we had more types of video games which we did not correlate in this research, after all, this strengthens the validity of both research results.

Model	R	R Square	Adj. R Sq.	Estimate	R Sq. Change	F Change	df2	Sig. F Change	Durbin-Watson
1	.362[a]	.131	.113	21.387	.131	4.631	647	.000	1.801

Predictors: (Constant), Sports games, Adventure games, Social media games, MMORPG games, Puzzles, Board games, MOBA games, FPS games, Card Games, VR games, Open World Games, TPS games, Battle Royale games, Platformer games[a]
Dependent Variable: Participant's VLT results[b]

Figure2. Regression model summary[b]

4.3.3. ANOVA

The ANOVA test (see Figure 3.) upholds the statistical significance difference in participants' VLT test results and the game types $F(13, 634) = 4.52$, $p = 0.00$. It was found out that the different video game types significantly influence VLT test results.

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	26954.419	13	2073.417	4.521	.000[b]
	Residual	217388.237	634	458.625		
	Total	244342.656	647			

Predictors: (Constant), Sports games, Adventure games, Social media games, MMORPG games, Puzzles, board games, MOBA games, FPS games, Card Games, VR games, Open World Games, TPS games, Battle Royale games, Platformer games[a]

Dependent Variable: Participant's VLT results[b]

Figure 3. ANOVAa

4.3.4. Visualized Results on Bar Chart

In order to make our findings more visible, the video game types were placed on the horizontal axis in order of the rank of their Spearman's rho correlation coefficients (see Figure4.). On the vertical axis we can see the percentage of the votes of the gamers, they do not add up to 100% because all gamer participants have marked their favourite games as well as those which they have played for the last 1-3 years, since they have been in the secondary education level. The first seven are the action games which may offer more options for information exchange. The rest of the games are miscellaneous regarding to communicativeness. Basically, among the 646 gamers, the three most played game types are the first-person shooter, the open-world and the battle royale. According to the Spearman's correlation, gamers who play these video games have better results on the VLT test.

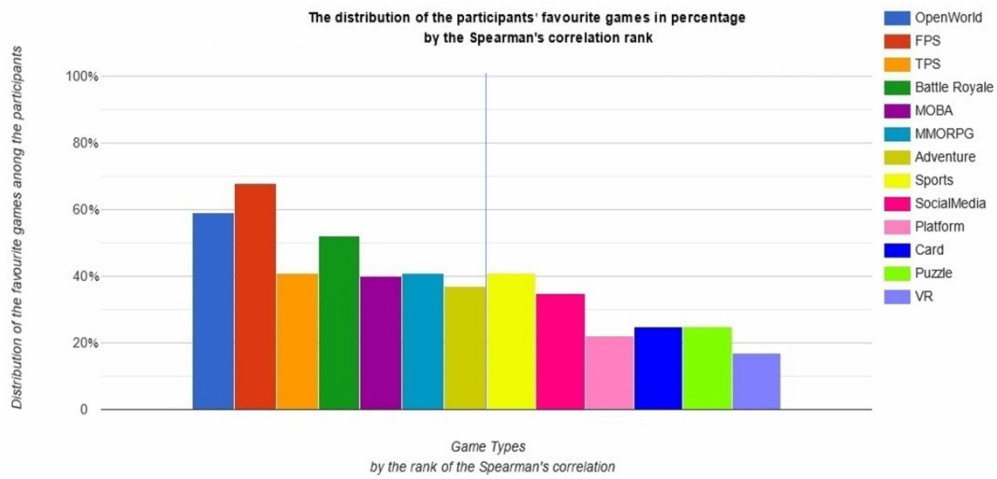

Figure 4. The distribution of the participants' favourite games in percentage by their Spearman's correlation rank

4.3.5. Further Regression Comparison

Nevertheless, we became interested in the difference of the influence on the VLT results if we divide the video gamers into two groups, in order to compare their regression results (see Figure 4). The first seven were named as the communicative video games, the other group became the less communicative. The regression summary (see Figure 5) shows that $R^2 = (.413)^2 = .157$, which means that the more communicative games contribute 15.7% to the VLT test results, whereas $R^2 = (.284)^2 = .064$, which means that the less communicative games only 6.4% (see Figure 5).

Model	R	R Square	Adj. R Sq.	Estimate	R Sq. Change	F Change	df2	Sig. F Change	Durbin-Watson
1	.413[a]	.171	.157	21.468	.171	7.166	647	.000	1.793

Predictors: (Constant), Adventure games, MMORPG games, MOBA games, FPS games, Open World Games, TPS games

Dependent Variable: Participant's VLT results[b]

Model	R	R Square	Adj. R Sq.	Estimate	R Sq. Change	F Change	df2	Sig. F Change	Durbin-Watson
1	.284[a]	.081	.064	21.840	.081	5.212	647	.000	1.776

Predictors: (Constant), Sports games, Social media games, Puzzles, board games, Card Games, VR games, Platformer games[a]

Dependent Variable: Participant's VLT results[b]

Figure 5. Regression model summaries[b] of the communicative game types and the less communicative game types

4.3.6. ANOVA

The ANOVA test (see Figure 6) strengthens the statistical significance difference in participants' VLT test results and the communicative game types F (7, 640) = 7.16, p = 0.00. It has been noticed that the communicative video game types significantly

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	23118.219	7	3302.603	7.166	.000[b]
	Residual	221224.436	640	460.884		
	Total	244342.656	647			

Predictors: (Constant), Adventure games, MMORPG games, MOBA games, FPS games, Open World Games, TPS games[a]

Dependent Variable: Participant's VLT results[b]

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	14916.216	6	2486.036	5.212	.000[b]
	Residual	229426.439	641	476.978		
	Total	244342.656	647			

Predictors: (Constant), Sports games, Social media games, Puzzles, board games, Card Games, VR games, Platformer games[a]

Dependent Variable: Participant's VLT results[b]

Figure 6. ANOVA[a]

The ANOVA test (see Figure 6) upholds the statistical significance difference in participants' VLT test results and the less communicative game types $F(6, 641) = 5.21$, $p = 0.00$. It has been remarked that the less communicative video game types also significantly influence VLT test results, but to a lesser extent.

The difference is meaningful, because all numbers suffer a significant influence of the more communicative games, so we can answer our research question: the communicative type of games contributes more to the VLT test results, from which we can conclude that those video gamers can benefit more from video gaming regarding vocabulary development that exploits all communication channels of the communicative games which provide online, verbal and written communication with written rules and continuous action and the probability of peer correction.

5. Discussion

We have ranged the video game types based on the calculated Spearman's rank, namely, which type has a greater/lesser influence on the VLT results (see Figure 1). As we expected, the games situated on higher ranks include more multiplayer games playable online as well as action games, where the audial, written and on-screen communication is intensive. Sport games are usually played alone or against a friend, but no more than two participants can play simultaneously, because of the nature of some sports games played only in pairs. Card games can be played in multiplayer mode, but there is no or just little communication among the players, and that is mostly in written form. The social media games are usually about building a village or a city, a task that is full of written and on-screen information. The bar chart (see Figure 4) clarifies the relationship among a particular game type, the proportion of the participants who played it and its rank of the Spearman's correlation coefficient. The first seven are the action games which may offer more options for information exchange, like verbal/audial and written. The rest of the games are miscellaneous according to their employed communication channel (e.g., sports, card or puzzle games) thus, less exploitable for language learning. Basically, among the 646 gamers the 3 most played game types are the first-person shooter, the open-world and the battle royale, consequently gamers who play these video games have better results in the VLT test.

The play as a social event enhances the procedural and the declarative learning occurrences, e.g., child play as the place of the procedural learning creates an intrinsic atmosphere at all ages from toddler to adulthood, which can facilitate the acquisition of both procedural and declarative knowledge. Video gaming

provides an ideal ambiance for implicit opportunities or learning while doing in which the participant first discovers the virtual area (identifies the objects), then these items are vocalized (online interactive games) while applying the rules in order to achieve the goal of the game level. Furthermore, the video games tend to have more challenging and complicated plots and provide opportunities for gamers to look for, and clarify, their game concepts (Lee, Aiken and Hung 2012). Having a game level completed the subsequent level regularly carries more difficult tasks in which, based upon the experiences of the previous level, the player initiates the discovery of unknown objects and tasks. Such exploration is essential to adjust the expertise up to the actual game level, otherwise the balance between the difficulty of the task and the gamer's knowledge overturn, thus the interest of the game level cannot be upheld (Klashen et al. 2012).

At video games there are several kinds of underlying sequence patterns which are usually a specialized attribution of a particular game, such sequences can be recognised within or at subsequent game levels. Pattern recognition is not just accelerating the reaction times, but can lead to discussions, when the latent patterns become verbalizable by the transition between implicit and explicit representation (Wessel, Haider and Rose 2012). If the gamer recognises a pattern or another important unreportable rule in the game, then this can be interpreted as an information treasure that yields an immediate sharing in written or verbal form on the social-media, thus the incidental patterns provided by the video games' virtual reality can initiate out-of-game communication cases, which is part of sociolinguistics.

6. Conclusion

According to the findings of the research the more communicative games provide more room for cooperating, thus practicing the language in a fruitful way. Although the research has reached its goal, it still has several limitations. For example, students from a certain area of the country were tested which also could provide opportunity to compare data with results from other discreet areas. Furthermore, despite the carefully chosen games and game types, the video game industry is changing so intensively, therefore this analysis is just a snapshot of the current situation. Further research could be interesting in revealing the relation between the video game activity and the students' orthographic or grammatical development in school. Finally, as it has been exposed, video gaming has a beneficial impact on foreign language learning and practice; moreover, this fosters the individual's willingness to communicate to become a more confident speaker.

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