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TYÖN NIMI / TITLE OF THE THESIS: Beauty is in the eye of the gamer: to what extent do commercial games reinforce English as a second language acquisition?

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Research has shown the potential of employing video game platforms for second language acquisition. Nevertheless, few studies have addressed the impact of non-educational commercial video games on second language learning as reported by the players themselves. Likewise, little research has studied in detail which are the aspects that players consider to be the most engaging when playing a commercial video game, related to language acquisition. This study aims at examining the player-reported impact of commercial video games on English language acquisition, in light of subjective gaming variables such as perceived enjoyment and complexity. 331 participants were asked to fill out a questionnaire along 12 days, enquiring about their gaming practices and the impact they perceive video games to have on English as a second language (ESL) acquisition. Correlations between variables were found employing Spearman’s rho. Results show on one hand that players see a significant correlations of video game practice on ESL skills, based on subjective perceptions of gaming. On the other hand, correlations were found between three game genre categories and language acquisition, in order to explore whether different characteristics inherent to each game category have a differential influence in learning, according to player reports. Results show that various video game categories have differential correlations, according to genre-dependent and playability variables (such as pacing, playability, interaction, and language quality and breadth). Participants also suggest reasons why different gaming categories can have a greater impact on second language learning, and mention qualitative differences in language use influenced by diverse gaming practices. Additionally, participants list video game genres different from those employed in the present analysis, and mention their perceived influence on second language acquisition. Findings from this study suggest that first, commercial games may indeed contribute to second language acquisition, in terms of reading, writing, speaking, listening, and vocabulary acquisition. Second, findings also suggest that second language acquisition varies depending on the game content, playability, pace, and interaction type. Finally, findings suggest that the highest potential for language learning is perceived within online massively played role-playing games, where the game presents a relatively complex content and the players are forced to read and listen to the input from the game in order to progress. Not only this, the highest learning potential can also be attributed to the necessity of interacting with other human players in a context where English becomes the lingua franca. Insights gained from this study can help integrate video game platforms into traditional classroom-based contexts, in order to exploit the affordances of using new technologies in learning (particularly, exploring and designing learning scenarios within non-educational video games, exploiting their large appeal and the broad offer of resources contemporarily).

Asiasanat/Keywords: human-computer interface, multimedia/hypermedia systems, teaching/learning strategies, commercial video games, English as a second language learning
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1 INTRODUCTION

Schooling nowadays faces increasingly complex challenges when it comes to providing learners with means that are both educationally meaningful and, perhaps more importantly, appealing and engaging. For many school-aged students today, going to school and working on paper-based assignments is increasingly undesirable. Easy and swift access to knowledge, along with a steady shift in the cultural conception of using technologies as a fundamental part of an individual’s life, has challenged what pedagogy has postulated, and what teachers have been traditionally trained to achieve. Whereas learners must still be presented with core competencies and certain areas of expertise according to common curricular designs, effort must be placed in presenting these knowledge and skills in a manner that exploits their interests and available resources. Otherwise, education will suffer as it has been visible in recent times: a large focus being placed on content acquisition through iteration and memorization leaving aside crucial methodological issues.

1.1 The research problem and its importance

Integrating new technologies into curricular design is not only desirable in terms of staying up-to-date with the latest findings in research, but also fundamental in providing students with a learning experience that will motivate to pursue knowledge acquisition. The usage of video games as alternative learning tools must be considered as an educational option. There is an extensive offer of digital games that strive to present meaningfully educational content in both direct and discreet approaches.

Research has shown the educational benefits of using highly regarded “smart games” in areas such as sciences (Bolaños, 2013; Shute & Ventura, 2015; Young, 2010) and language learning (Smith et al., 2013; Lin, 2015; Aghlara & Tamjid, 2011; Sørensen & Meyer, 2007). Most studies, however, address the issue from an external perspective - usually in the form of an evaluator assessing learning outcomes drawn from a game itself. However, these findings assume that learning comes to players equally, disregarding their preference for video game genres and types of playability. There is much that can be drawn from the players’ perspective when exploring which are the ideal contexts under which learning can take place, and which game genres and types are players most likely going to become engaged to when being presented with educational challenges. To address this gap, this study aims to obtain insights from the players themselves, not only taking into account the usually
studied variables related to learning outcomes, but also variables related to subjective experiences of play itself that lead to engagement. Determining which are the deciding factors for players to stick to a video game can give ample insights for accurate and meaningful educational design for both teachers and game designers.

On the other hand, most research has shown the benefits of employing video games with an inherent learning value (e.g. the above-mentioned smart games). Nevertheless, there has been scarce research regarding commercial video games - those whose central purpose is not related to educational values. As such, this study addresses the educational input that players perceive from playing these games, which has not been explored before. Knowing that commercial games are highly regarded by players, finding where are the advantages concerning language acquisition in already popular titles and genres can be very beneficial in integrating their practice into educational programs. If a learner is highly motivated by certain aspects of video games, designing engaging and educational video games becomes a possibility.

1.2 Aims of the study

The general aim of this study is to study how the practice of commercial, non-educational video games relates to English as a Second Language (ESL) skills acquisition. This is observed through two different perspectives that characterize the experience of play: on one hand, subjective aspects of practicing the game itself (i.e. perception of enjoyment and perception of difficulty) and time spent within particular categories of video games. On the other hand, aspects of content and playability of three distinct video game categories.

Aiming to investigate whether commercial video game practice correlates with ESL skill acquisition, the present study addresses the following research aims:

1. Investigate how perceived degree of game complexity and perceived enjoyment in video games correlate with ESL skill acquisition.
2. Establish a correlation between time spent playing specific video game categories and perceived ESL skill acquisition.
3. Assess how content and playability of video games correlate with second-language learning.
4. Investigate the impact human-to-human interaction has on ESL skill practice and acquisition in Role Playing Games (RPGs) and Multiplayer Online Battle Arena games (MOBAs).
2 THEORETICAL FRAMEWORK

Commercial video games nowadays are extensively played by gamers worldwide (only in the United States an estimated 155 million people play video games) and are highly engaging, as evidenced in the contemporarily increasing numbers of gender-independent market participation and the emergence of professional leagues, which attract a massive attention from players and viewers (Entertainment Software Association, 2015). English is the preferred language of communication in gaming, which demands communicative skills from players whose mother tongue is not English, even if the sole purpose of commercial games is entertainment. The following sections explore inherent characteristics of video games that represent affordances for educational use, such as complex human-to-human interaction, content scripted at different degrees of tightness, and subjective experiences linked to game progression. These characteristics are assessed further in the present paper.

2.1 Video games: engagement and freedom

Video games allow an immersion in a new world at such a level that it introduces a new form of interaction (Steinkuehler, 2006). Reaching said immersion in a learning context as provided by video games is an advance in terms of teachers’ classically evasive goal: achieving a level of engagement such that it feels familiar and interest toward the content and practice are spurred. Particularly in MMORPGs, human-to-human interaction has a fundamental role in the perception of language acquisition, as is explored further in this paper. Language learning affordances do not come exclusively from game-presented content, but to a greater extent from qualitatively different languages used with other players. On the other hand, employing a video game that allows the player an unprecedented control, and allows the player the option of moving freely and taking decisions that challenge her capacities, enables the player to face problems from different perspectives and feel the need of solving them using advanced processing strategies (Griffiths, 2002). Therefore, the tightness of game scripting introduced by different games can have an impact on player problem solving and learning, as will be delved on further in this paper. In general, this paper finds how less tightly-scripted games tend to be more beneficial to a perception on language learning.
2.2 Subjective experiences in video game play

The link between video game experience and enjoyment has been studied previously, showing that the way players relate to the game, and the type of content the game presents, affects their perception (Shafer, 2014; Vorderer, Hartmann & Klimmt, 2003; Klimmt, Blake, Hefner, Vorderer & Roth, 2009). Learning through a video game is shown to be more rewarding and productive than employing traditional one-dimensional communication channels, due to the fact that players have a hand in determining the final outcome of the game. Lombardi (2012) affirms that humorous content embedded in games correlates with a higher learner motivation for language learning, since the player enjoys the comical experience while having to understand the humorous content linguistically, thus needing to delve deeper into language intricacies.

Lombardi (2012) makes a characterization of humorous content embedded in video games for language learning, and how meaningful it turns out to be for that purpose. From a standpoint by which digital games should be captivating and fun to play, the author states that verbal figurative humor content is directly related to motivation for learning (as it is closely intertwined with a language and its culture). Being culturally driven, humor is especially dependent on the context, and as such provides an ample range of affordances to second-language learning, inserted in a space in which the player can access new vocabulary and understand it aided by visual, audible, or other type of cues. If a player wants to find the content funny, he must first understand the grounding for said humorous content, thus needing to delve deeper into language intricacies (usually determinants of humorous content - consider the "swallowing a red herring" word game as an example). Nevertheless, even if humor is a strong motivator of action - which can be deeply exploited in educational settings -, it should not be overused, as it might diminish meaningfulness of the task, making it be perceived as something not serious. Likewise, it is cognitively demanding, so an abuse would result in overload or an attention monopolization, straying the focus from the content which is facilitated by humor itself (Lombardi, 2012). This paper explores further that a varying degree of enjoyment within the game is related to its content, as players report according to their own experiences of play.

Research has also shown that game-perceived difficulty attributes have an effect on learning outcomes in game-based learning environments (Garris, Ahlers & Driskell, 2002; Orvis, Horn & Belanich, 2007). In general, challenges presented to gamers yield positive learning outcomes when the game presents challenges that are located at an optimal level of
difficulty, in line with Vygotsky’s zone of proximal development (Vygotsky, 1987). When located at either side of the scale, learner motivation tends to diminish, as well as participation interest. As can be perceived ahead in the present study, varying levels of difficulty affect the perception of learning from within a game.

2.3 Video games and language learning

Using a video game to convey second-language literacy can, at first glance, increase engagement in the student, providing an entertaining experience that spans across activities associated commonly to core desirable experiences in people (story, play, social, learning) (Purushotma, Thorne & Wheatley, 2008). Media offer typically includes one of said activities - which are closely related to language utilization - attempting to highlight the attractiveness of the platform based on a single action, while disregarding the others.

Corredor & Gaydos (2014) observed the affordances of massively-multiplayed video games on creating communities in which bilingual interaction is possible and mandatory. In these communities, second-language interaction serves an instrumental value to reach specific goals. In this paper the authors investigate how the situated nature of gaming contributes to the development of second language proficiency in non-bilingual contexts. They observe the use of the English language in common interaction between the gamers, and highlight the potential of massive multiplayer online role-playing games (MMORPGs) as a teaching tool in multicultural contexts.

Chen & Yang (2013) studied the impact of an adventure video game on foreign language learning. By assessing vocabulary acquisition prior to, and after having played a video game, they concluded that there is a visible increase in terminology presented in-game. Going further, they observed positive attitudes from participants toward learning a foreign language through a commercial video game platform.

Liu & Chu (2010) studied how using ubiquitous games in a listening and speaking English course influences learning achievement and motivation in high school learners. By immersing students into a ubiquitous learning environment while involving various educational strategies, such as context-aware learning and game-based learning, they found that incorporating games into English instruction yielded better learning outcomes and motivation than traditional classroom-based methods.

Schumman (1999) explored which factors are responsible for the large variations seen in the success rates of different second-language learners. Through studying a number of
surveys and case studies that analyze the neurological learning mechanisms responsible for the motivation of language learners, the author identifies five main elements that show up regularly in successful learners’ learning environments, which can be tightly linked with video game language learning content, as shown in Table 1.

Table 1: Common elements in successful learning environments (Schumman, 1999)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novelty</td>
<td>Less repetition, more systematic content generation yields greater interest and engagement in the player.</td>
</tr>
<tr>
<td>Pleasantness</td>
<td>Less direct address to content (e.g. grammar), more implicitly included content - background content yields pleasant, engaging experiences in players.</td>
</tr>
<tr>
<td>Relevance to individual goals and needs</td>
<td>Using constraints to devise goals and needs for a player.</td>
</tr>
<tr>
<td>Coping potential</td>
<td>Games adjusting their difficulty to challenge the player, without exceeding their potential (in line with the zone of proximal development).</td>
</tr>
<tr>
<td>Compatibility with self and social image</td>
<td>How to apply acquired language skills in virtually-mediated interaction.</td>
</tr>
</tbody>
</table>

3 CONTEXT AND PARTICIPANTS

After having developed the research plan and questionnaire, it was thought that an ideal situation would pool data from respondents from different nationalities. The supervisor for the present paper aided the author on the use of a web service for survey design and data collection, Webropol, for which the University of Oulu has full access. Afterward, it was decided that the questionnaire would be shared openly, attempting to attain a random sample.

Participants, both self-styled and not-self-styled gamers whose mother tongue was not English, were asked to fill out an Internet-based questionnaire. Individuals from 26 different countries participated, for which participation was clarified as voluntary and anonymous. From a total of 331 participants, 64.5% (N=213) were males and 34.8% (N=115) were females, with a mean age of 24.61 (SD=6.96). When asked whether they considered themselves gamers, 71.2% (N=235) of the participants stated they did. In terms of their education, 36.6% (N=121) of the participants reported they had attained at least a Bachelor’s degree. It is worth mentioning that the third quartile was on a Bachelor’s degree (item 4 of 7 on the scale), yielding a total of 80.6% of the participants (N=266) having attained a Bachelor’s degree, or less. Additionally, 95.1% (N=314) of the participants stated they had received formal English instruction.
4 METHODOLOGY AND RESEARCH DESIGN

This chapter introduces the research methodology used in data collection for this thesis. A quantitative, quasi-experimental research design was chosen for the present study, aiming to obtain a wide perspective on the issue at hand and striving to attain high external validity. This was planned from the beginning, and was further picked as the most exploitable option, since there was such a broad number of respondents to the questionnaire, many more than were expected. Therefore, employing a quantitative approach for the data analysis proved to be the most useful for obtaining significant results.

4.1 Instrument and procedure

A questionnaire (see appendix A) was developed enquiring about game-related variables (e.g. game content, gameplay style, time spent playing, perceived enjoyment and complexity), and their correlation with perceived measures of influence on ESL skill acquisition. Questionnaires enquiring about player perceptions toward games and language gains from their practice have been used previously, e.g. Chen & Yang (2013). The questionnaire was shared via email and social networks over a span of 12 days. As the questionnaire was issued online, and there was no treatment exercised on the participants, there was no need for an informed consent. Participants were informed of the purpose for the study, and were offered the opportunity to access the final product. Likewise, data anonymity was informed and ensured (in fact, no names or other forms of specific ID were required in the questionnaire). Takers were informed as they started taking the questionnaire that they could stop their participation at any time, with none of their data stored. There was one open question for participants who had played games within more than one category, from a total of three (see table 3 below). This question aimed to determine self-reported advantages, challenges, and other details that underlay second-language acquisition within video game settings in both single and multiplayer contexts. Answers could prove fundamental as a pilot study for bridging the results with a future in-depth analysis.

4.2 Characterization of selected video games

The games used in the present study were selected according to a specific classification based on variables such as gameplay type and pace, game content and content
complexity, and in-game reading/interaction quality. In line with the aims for the present study, correlations between the three game-related variables (time spent playing, perceived enjoyment and perceived complexity) and language acquisition were studied, as reported by the players. The games selected for the present study are commercial, highly popular games that have received critical acclaim over the years after their release. Table 2 shows the video games selected for the present study.

Table 2: Video games and categorization

<table>
<thead>
<tr>
<th>Category 1 Games: fast-paced action and sports</th>
<th>Category 2 Games: single player (offline) RPGs</th>
<th>Category 3 Games: online RPGs and MOBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIFA series</td>
<td>The Legend of Zelda series</td>
<td>World of Warcraft</td>
</tr>
<tr>
<td>Pro Evolution Soccer series</td>
<td>The Elder Scrolls series</td>
<td>League of Legends</td>
</tr>
<tr>
<td>Halo series</td>
<td>Final Fantasy series</td>
<td>Guild Wars</td>
</tr>
<tr>
<td>Call of Duty series</td>
<td>Dragon Age series</td>
<td>Runescape</td>
</tr>
<tr>
<td>Battlefield series</td>
<td>Fallout series</td>
<td></td>
</tr>
</tbody>
</table>

Participants understood that no game could belong to more than one category simultaneously, as categories were designed to be mutually exclusive and were presented as such in the questionnaire. All games within each series were contemplated in the analysis, where applicable (e.g. only offline versions of Final Fantasy and The Elder Scrolls were counted for Category 2). Table 3 introduces a brief characterization of some of the games employed, and a description on elements of analysis present in each game category.

Table 3: Characterization of games and categories (see e.g. Cornilie, Clarebout & Desmet (2012)).

<table>
<thead>
<tr>
<th>Game</th>
<th>Description</th>
<th>Gameplay type, game content, in-game reading/interaction type/quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIFA (1993-)</td>
<td>A commercial success, this highly competitive football simulation game enables gamers to control a team of their choice with players that correspond to real life professionals and compete against either the CPU or other gamers. A new installment is presented every year, making it a staple in sports fans, and a profit powerhouse.</td>
<td>Fast-paced games, both sports and action require from the players decision taking over tightly scripted scenarios, without having a significant effect on game progression and experience. Players receive simple prompts and other audio input which are not usually vital to game progression.</td>
</tr>
<tr>
<td>Call of Duty (2003-)</td>
<td>A member of the very popular FPS (first-person shooter perspective) genre, this game allows players to progress through a set campaign with varying levels of difficulty, where the objectives are to employ infantry tactics to win battles with conventional weaponry. From its original release, it has kept a steady presentation of new installments.</td>
<td>Presented vocabulary is usually limited and context-specific. These games do not require an ample reading comprehension skill. No interaction with other human players.</td>
</tr>
<tr>
<td>The Legend of Zelda (1986-)</td>
<td>Originally intended to be a fairy tale story following the hero-saves-princess theme, it has evolved over the years as an adventure RPG,</td>
<td>Not typically fast-paced, offline RPGs require from the players decision making over loosely scripted</td>
</tr>
</tbody>
</table>

11
introducing attractive visual effects through casual gameplay.

| Category 3 games | Elder Scrolls: Skyrim (2011) | One of the most representative games in the sandbox, open world offline RPGs, this game presents a universe as open and enticing as the player wants it to be, along with an extensive lore of historical affairs within its fictional world. It uses the contemporarily popular randomly generated content algorithm, making it virtually endless in terms of game objectives.

Presented vocabulary is wide and not necessarily context-specific. These games commonly require attentive reading and/or listening for progressing.

No interaction with other human players.

| | League of Legends (2009-) | A PvP (player versus player) online-exclusive free-to-play MOBA (massive online battle arena), this widely regarded game pits two teams of five human players against each other in a strategic quest to defeat the opposition. It has been a critical success and continues to gain adepts to this day.

Both slow and fast-paced, online RPGs require from the players decision making over loosely scripted scenarios, or completely unscripted scenarios, where decisions have a significant effect on game progression and experience. Players receive simple/complex prompts and other audio input which are normally vital to game progression.

Presented vocabulary is wide and not necessarily context-specific. These games commonly require attentive reading and/or listening for progressing.

Interaction and role play with other human players is fundamental for player experience and progression. Interaction between human players is not necessarily game-related. Collaboration is commonly seen and is typically necessary to progress or succeed.

| | World of Warcraft (2004-) | Considered by many as the epitome of online gaming, this MMORPG enables the player to control a fully unique fantasy character and live within an immense game world rich in lore and game objectives. Social play lies at its core, requiring constant interaction with other players in order to fully exploit the game mechanics and capabilities.

Data from three distinct game categories was recorded and analyzed independently using the SPSS 22 software platform. A quantitative analysis was utilized showing independent variable measures and correlations between variables to obtain a detailed picture of participants’ responses. Since no assumptions can be made about probability distributions due to the fact that the outcome is an ordinal variable for all cases, the nonparametric Spearman’s rho test is employed in the analysis, nevertheless taking statistical advantage of...
the broad amount of questionnaire respondents (Gibbons & Chakraborti, 2011). Since the questionnaire was based on self-reports at a specific point in time, and each construct was assessed with only one question, there was no need to assess reliability.

Each of the following variables was measured three times, once per gaming category. Variables enquiring about game-related information were the following:

1. Fraction of total playing time (in percentage) per game category.
2. Perceived degree of enjoyment of gaming experience within a specific game category.
3. Perceived level of complexity of each game category.

The five main skills associated to ESL were selected as variables, with independent measurements per each of the three gaming categories:

1. Perceived impact of gaming experience on reading comprehension.
2. Perceived impact of gaming experience on writing.
3. Perceived impact of gaming experience on listening.
4. Perceived impact of gaming experience on speaking.
5. Perceived impact of gaming experience on vocabulary acquisition.

All variables were assessed employing Likert scales with 4 items, except fraction of total playing time (with a Likert scale of 5 items).

5 RESULTS

From all the participants, 62.8% (N=208) played games from category 1 (sports and first-person shooters); 54.0% (N=179) played games from category 2 (single player offline RPGs); and 42.2% (N=140) played games from category 3 (online RPGs and MOBAs). Responses from participants that had played more than one game category were recorded independently. Figure 1 shows the measures of game-related variables in player reports within the three video game categories.
Participants were asked to grade the perceived impact of game-related variables on five ESL skills. Table 4 shows the perceived impacts of playing games on the five ESL skills, in each of the three game categories. The frequency of scores obtained in the questionnaires for each of the 5 ESL skills is shown.

Table 4: Frequency of scores per ESL skill impacts within each game category

<table>
<thead>
<tr>
<th>ESL Skills</th>
<th>Game Category</th>
<th>Frequency of scores</th>
<th>1=Not at all /Almost not</th>
<th>2=Somewhat</th>
<th>3=Considerably</th>
<th>4=Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>1</td>
<td>27,5%</td>
<td>33,8%</td>
<td>25,6%</td>
<td>13,0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9,1%</td>
<td>20,6%</td>
<td>40,6%</td>
<td>29,7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>15,8%</td>
<td>25,2%</td>
<td>38,1%</td>
<td>20,9%</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>1</td>
<td>40,8%</td>
<td>36,4%</td>
<td>17,0%</td>
<td>5,8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>23,2%</td>
<td>33,9%</td>
<td>32,8%</td>
<td>10,2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>20,6%</td>
<td>26,5%</td>
<td>31,6%</td>
<td>21,3%</td>
<td></td>
</tr>
<tr>
<td>Listening</td>
<td>1</td>
<td>15,0%</td>
<td>32,4%</td>
<td>32,9%</td>
<td>19,8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13,1%</td>
<td>30,7%</td>
<td>36,9%</td>
<td>19,3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>19,6%</td>
<td>37,7%</td>
<td>24,6%</td>
<td>18,1%</td>
<td></td>
</tr>
<tr>
<td>Speaking</td>
<td>1</td>
<td>33,7%</td>
<td>40,5%</td>
<td>16,6%</td>
<td>9,3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>29,6%</td>
<td>33,5%</td>
<td>25,7%</td>
<td>11,2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>26,8%</td>
<td>32,6%</td>
<td>23,9%</td>
<td>16,7%</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>1</td>
<td>14,4%</td>
<td>43,3%</td>
<td>26,9%</td>
<td>15,4%</td>
<td></td>
</tr>
<tr>
<td>Breadth</td>
<td>2</td>
<td>6,1%</td>
<td>24,6%</td>
<td>36,9%</td>
<td>32,4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>12,1%</td>
<td>29,3%</td>
<td>32,9%</td>
<td>25,7%</td>
<td></td>
</tr>
</tbody>
</table>

Correlations were found between the three game-related variables (percentage of total playing time spent within each game category, perceived degree of enjoyment within the
game category, and perceived level of difficulty/complexity in each game category) and the perceived impact of play on five ESL skills. The employed correlation coefficient was the nonparametric Spearman’s rho. Correlations were reported in groups, considering the large amount of variables. Tables 5, 6, and 7 show the correlations between said variables for games belonging to each of the three categories.

Table 5: Correlations for Game Category 1 (first-person shooters and sports)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent with category 1 games r</th>
<th>Perceived enjoyment r</th>
<th>Perceived level of game complexity r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>.373</td>
<td>.301</td>
<td>.050*</td>
</tr>
<tr>
<td>Writing</td>
<td>.247</td>
<td>.249</td>
<td>.045*</td>
</tr>
<tr>
<td>Listening</td>
<td>.347</td>
<td>.318</td>
<td>.049*</td>
</tr>
<tr>
<td>Speaking</td>
<td>.335</td>
<td>.310</td>
<td>.007*</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.283</td>
<td>.197</td>
<td>.043*</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01; *non-significant

Table 6: Correlations for Game Category 2 (offline role playing games)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent within category 2 r</th>
<th>Perceived enjoyment r</th>
<th>Perceived level of game complexity r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>.360</td>
<td>.382</td>
<td>.327</td>
</tr>
<tr>
<td>Writing</td>
<td>.353</td>
<td>.354</td>
<td>.297</td>
</tr>
<tr>
<td>Listening</td>
<td>.269</td>
<td>.299</td>
<td>.332</td>
</tr>
<tr>
<td>Speaking</td>
<td>.278</td>
<td>.323</td>
<td>.326</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.336</td>
<td>.383</td>
<td>.294</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01

Table 7: Correlations for Game Category 3 (online role playing games and multiplayer online battle arena)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent within category 3 r</th>
<th>Perceived enjoyment r</th>
<th>Perceived level of game complexity r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>.421</td>
<td>.490</td>
<td>.369</td>
</tr>
<tr>
<td>Writing</td>
<td>.438</td>
<td>.487</td>
<td>.334</td>
</tr>
<tr>
<td>Listening</td>
<td>.359</td>
<td>.479</td>
<td>.370</td>
</tr>
<tr>
<td>Speaking</td>
<td>.399</td>
<td>.500</td>
<td>.396</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.430</td>
<td>.478</td>
<td>.353</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01
At first glance, according to tables 5, 6, and 7 there are moderately strong, positive correlations between the three game-related variables and the five language skills (with the exception of perceived level of game complexity for game category 1 across the five language skills). Thus, it can be concluded that game-related variables have a correlation with ESL skills, in line with research aims (1) and (2).

To obtain a wider perspective on the impact of gaming on language skills in terms of whole game categories, it becomes necessary to scale out the level of analysis and study the differences among the game categories in terms of game-related variables (e.g. content and playability) and ESL skill acquisition. Table 8 presents a summary of the correlations obtained per each game-related variable, per game category.

<table>
<thead>
<tr>
<th>Game Category</th>
<th>Percentage of Time spent</th>
<th>Perceived enjoyment</th>
<th>Perceived level of game complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Mean r</strong></td>
<td><strong>Mean r</strong></td>
<td><strong>Mean r</strong></td>
</tr>
<tr>
<td>Category 1</td>
<td>.317</td>
<td>.275</td>
<td>.038*</td>
</tr>
<tr>
<td>Category 2</td>
<td>.319</td>
<td>.348</td>
<td>.315</td>
</tr>
<tr>
<td>Category 3</td>
<td>.409</td>
<td>.487</td>
<td>.364</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01; *non-significant

The strength of the correlations varies between categories, which suggests that elements of content and playability also correlate with ESL skill acquisition, in line with research aim (3). According to the results, players perceive an increased impact in language acquisition when game pace and scripting diminish, and narrative content increases.

A comparison between the mean correlations between game categories 2 and 3 shows that human interaction determines an increased perception of impact in language acquisition. Since categories 2 and 3 are largely similar in terms of gameplay pace, content and type of narrative, it can be concluded that the difference comes as a result of human interaction, in line with research aim (4).

6 DISCUSSION

Highly popular, commercial video game practice correlates with ESL skill acquisition when pairing it with gameplay-related variables, subjective experiential variables, and time spent playing. After conducting the data analysis, the hypotheses were proved for the
majority of cases (see tables 6, 7, and 8), in line with other studies that have found similar evidence regarding second language acquisition (Lin, 2015; Aghlara & Tamjid, 2011; Sørensen & Meyer, 2007; Chen & Yang, 2013; Corredor & Gaydos, 2014). Still, further research is required in order to observe in greater detail how different measurements of game-related variables correlate with ESL skill acquisition (e.g. a greater time spent playing yields greater ESL skill acquisition). Also, a broader study should be conducted to establish the correlation between background variables such as age, education, nationality, and gender in game experience and ESL skill acquisition.

According to the findings in the present study, there is a positive correlation between game enjoyment and ESL skill acquisition. In line with Schafer (2014), by whom player skill at the game affects the degree of enjoyment, a greater benefit at ESL skill acquisition could be reaped by studying varying degrees of game-related skills in the players (e.g. the more a player manages to progress in an adventure game, or the more goals a player scores due to ability, the better the resulting ESL skill acquisition). Observed correlations between enjoyment and ESL skill acquisition parallels Lombardi’s findings (2012), by which gaming enjoyment comes as a result of variable game narratives and content types, which in turn increases motivation for language acquisition in players with specific tastes.

In terms of game complexity, results show in general that it correlates with ESL skill acquisition. This suggests that players perceive variations in difficulty as beneficial for language acquisition, in accordance to Schumman (1999); Garris, Ahlers & Driskell (2002) and Orvis, Horn & Belanich (2007). Nonetheless, for games belonging to category 1 (fast-paced sports and first person shooters), a different level of reported complexity in the game experience does not correlate with significant impacts on ESL skill acquisition. Taking into consideration that this same measurement did yield positive correlation for the other two game categories, it could be suggested that when there is little time to assimilate what language content the game has to present, or when said content is not crucial to game progression, varying the challenge level of the game does not represent gains in language learning. On the other hand, it could be stated that the level of concentration a fast-paced video game usually requires is proportional to its difficulty; thus, a greater level of difficulty could require ampler cognitive resources, potentially hindering language acquisition.

To observe how each game category contributes independently to ESL skill acquisition in terms of game content and playability, a comparison of average correlations per ESL skill was run. Results (see table 8) show minimally stronger correlations in category 2 (offline RPGs) than in category 1 (sports and shooters), not yielding significant enough
differences (other than the fact that there was no significant correlation between perceived complexity and any of the ESL skills for category 1). Player perception of ESL skill acquisition varies negligibly between sports and shooters, and offline RPGs. This could suggest that the perceived impact on ESL skill acquisition does not necessarily depend on game pace and complexity of introduced prompts and dialogues. Whereas the benefit of employing role playing games to support ESL skill acquisition was shown, in line with Cornillie, Clarebout & Desmet (2012), future research should aim at establishing increasingly specific differences between the two game genres in terms of language content. Nevertheless, category 3 showed relatively stronger correlations than the other two game categories. The presence of human-to-human interaction in online RPGs and MOBAs appears to increase the perceived impact game practice has in ESL skill acquisition. Players within category 3 are presented with human-to-human interaction in addition to CPU-to-human interaction, widening the experience of second language through non-standard communication practices such as code-switching, abbreviations, and alternative grammars, and an extensive context-exclusive lexicon. It is especially relevant to point out that the difference between game categories 2 and 3 is mostly dependent on human mediation, since game mechanics and content are similar at large. The added complexity to linguistic usage, vocabulary, and non-standard language practices, for example, could play a role in making players perceive their gaming experience as supportive to their language learning. Further research could provide insights on the role of human mediation when within the same game in both offline and online settings. Even more, benefits and risks of learning a second language in bilingual communities producing non-standard language practices in commercial games could be studied, further extending Corredor’s & Gaydos’s (2014) research into educational video games. Additionally, observing which forms of interaction provide the best context for language learning in human-mediated game settings, and how to design them, can prove beneficial for design engaging games with an educational value, in line with Steinkuehler (2006).

Since all data gathered for the present study was based on self-reports drawn from video games whose aim is not educational, no generalization can be made for educational video games. Additional research on self-reported impact of educational video games in language learning based on the variables employed in the present study would prove useful in establishing contrasts between players’ perceptions of ESL skill acquisition according to the purpose of the game. Likewise, placing commercial video game practice in parallel to
traditional classroom-based teaching methods could be observed in order to find ways in which differential language teaching methodologies can complement each other.

Performing a qualitative analysis via interviewing participants that have played the three game categories could widen the understanding on the intensity and the nature of the impact of games on ESL skills, looking for divergence in terms of language quality/formality and the usage of abbreviations, acronyms and contractions, for example. Analyzing types of interaction across video game-mediated channels (e.g. within the game itself or in gaming-related forums) could also provide insights on how video games and video game-related content correlate with differential ESL skill acquisition levels. In parallel to this, a qualitative analysis on subjective variables employed in the present study would allow for a more in-depth comprehension of what participants perceive as being a gamer, as enjoying a game, or as perceiving it complex, and how these mediate in ESL skill acquisition. Further study could provide insights on the depth, pertinence, and transferability of second-language skills acquired in domain-specific contexts introduced by the video games.

When designing the questionnaire, games per category were selected on popularity and widespread acclaim; nevertheless, this does not mean that participants play those games exclusively. Some participants reported through the open question having played games from entirely different categories from those presented in the present study (or having played games that belong to more than one category simultaneously, such as the first-person shooter/RPG Borderlands). Several participants commented on other game genres with a reported high impact on ESL skills, such as Real Time Strategy games (e.g. Starcraft, Age of Empires) and Life Simulation games (e.g. The Sims). Further study could provide useful insights into the nature and quality of language acquired through other video game genres.

7 CONCLUSION

This study investigated the effects of commercial video games on English skill acquisition in parallel to subjective game experience variables, game type and gameplay style, and time spent playing, according to players’ self-reports. The results of the study have yielded several interesting findings. First, based on an individual questionnaire, it has been shown that there is a correlation between ESL skill acquisition and subjective gaming experience and time spent played. Players perceive commercial video game practice as a positive way to improve their English reading, writing, listening, speaking and their lexicon. Second, different game categories yield diverse correlations between game-related variables
(game enjoyment, complexity, and time spent playing) and ESL skill acquisition. These findings further show the potential of video games as an educational tool in second-language learning, and should encourage further research into how and to what extent commercial video games should be employed in supporting second-language learning in technology-mediated contemporary society. Likewise, these findings can assist game design to go further and design both educational and non-educational video game content in such a way that language development potential is maximized while keeping the platform attractive enough for players to be engaged and have legitimate fun in its practice. For one, linking game progression with even tighter scripting in fast-paced games could guarantee that players read through and listen to the text presented in-game (which follows Griffiths’ (2002) affirmation by which learning comes differentially according to player control over the environment). In an analog fashion, increasing the frequency of text and audio content presentation in online RPGs (and augmenting the complexity of content presented) could spur players to use game-acquired language more strictly. That way, a more systematic educational approach would be employed to introduce players to specific forms of language and lexicon. Finally, considering that offline RPGs are almost exclusively story-driven, games could be further designed drawing from contemporary common usage of the language, to maximize the transferability of lexicon and language usage players acquire through play.

8 REFERENCES


9 APPENDICES

Questionnaire enquiring about video game practices

SURVEY LINK
https://www.webropol.com/S/21FB3A609863085B.par

HEADER:
Good day. As part of my thesis research in the program Learning, Education and Technology at the University of Oulu, I want to study the existing relationship between playing video games and English as a second language skill acquisition. If you wish to assist me and participate, please take the following survey (about 5-10 minutes long) available from the link. Please take the questionnaire only if your mother tongue IS NOT English.

If you wish to obtain further information, please contact Daniel Bolaños at the following email address: danielsan_b@yahoo.com. Thank you for your time and attention.

Questionnaire on video gaming and English language.
The following questionnaire enquires about the relationship between video game practice and English as a second language individual skill acquisition, in light of game content and other subjective variables. It is intended only for those whose first language (mother tongue) is NOT English. Your participation is voluntary and anonymous. Information from participants will be only observed by the researcher, and will be used for academic purposes exclusively. If at any time during the questionnaire you do not wish to continue, simply close the web browser, and your data will not be saved.

This research is done by Daniel Bolaños, student in the Master’s in Learning, Education, and Technology at the University of Oulu, Finland, under the direction of Essi Vuopala, PhD, adjunct professor at the Learning, Education, and Technology unit from the University of Oulu, Finland. If you have any doubts or questions, please write to danielsan_b@yahoo.com.

Please read the questions presented carefully and answer accordingly.

1. Age
__________________________________________________________________________

2. Nationality
__________________________________________________________________________

3. Gender

1  ○ Male
2  ○ Female
3  ○ Other

4. What is your highest level of education completed?

4  ○ Attending mid/high school
5  ○ High school
6  ○ Vocational/Technical degree
7  ○ Bachelor’s (undergraduate degree)
8  ○ Master’s degree
9  ○ Ph.D.
10  ○ Other

5. Have you received formal English instruction (in school, university, language institution)?

11  ○ Yes
12  ○ No
6. Do you consider yourself a gamer (or have you considered yourself a gamer at some point earlier in your life)?
   13  ○ Yes
   14  ○ No

7. Where have you spent most of your life as a gamer?
   15  ○ Rural Area
   16  ○ Urban Area
   17  ○ Not Applicable (not a gamer)

8. How many hours of video games do (did) you play per week, on average?
   ____________________________

9. Have you played at least one of these games (playing **OFFLINE** - **IN ENGLISH**)?
   FIFA Soccer series
   Pro Evolution Soccer series
   Call of Duty series
   Halo series
   Battlefield series
   18  ○ Yes
   19  ○ No

   FIFA series, Pro Evolution Soccer series, Call of Duty series, Halo series, Battlefield series (playing **OFFLINE** - **IN ENGLISH**) •

10. On estimate, what percentage of your total playing time have you spent playing this game(s)?
    20  ○ 0-20%
    21  ○ 21-40%
    22  ○ 41-60%
    23  ○ 61-80%
    24  ○ 81-100%

For the following questions, please answer what best suits your perception on a scale of 1 to 4, according to the guide presented in each question.
•

11. How much do you enjoy playing this game(s)?
    25  ○ 1 (not at all / almost not)
    26  ○ 2 (somewhat)
    27  ○ 3 (considerably)
    28  ○ 4 (extremely)
12. How difficult / complex was this game(s)?

- 1 (not at all / almost not)
- 2 (somewhat)
- 3 (considerably)
- 4 (extremely)

13. How important is it for you to read and listen to the content presented by the video game while you are playing?

- 1 (not at all / almost not)
- 2 (somewhat)
- 3 (considerably)
- 4 (extremely)

14. In your opinion, what impact did playing this game(s) have in your reading comprehension skill in English?

- 1 (none at all / almost none)
- 2 (somewhat)
- 3 (considerable)
- 4 (extreme)

15. In your opinion, what impact did playing this game(s) have in your writing skill in English?

- 1 (none at all / almost none)
- 2 (somewhat)
- 3 (considerable)
- 4 (extreme)

16. In your opinion, what impact did playing this game(s) have in your listening skill in English?

- 1 (none at all / almost none)
- 2 (somewhat)
- 3 (considerable)
- 4 (extreme)

17. In your opinion, what impact did playing this game(s) have in your speaking skill in English?

- 1 (none at all / almost none)
- 2 (somewhat)
- 3 (considerable)
- 4 (extreme)

18. In your opinion, what impact did playing this game(s) have in your vocabulary in English?

- 1 (none at all / almost none)
19. Have you played at least one of these games (playing **OFFLINE - IN ENGLISH**)?

The Legend of Zelda series
The Elder Scrolls series
Final Fantasy series
Dragon Age series
Fallout series

57   Yes
58   No

The Legend of Zelda series, The Elder Scrolls series, Final Fantasy series, Dragon Age series, Fallout series (playing **OFFLINE - IN ENGLISH**)

20. On estimate, what percentage of your total playing time have you spent playing this game(s)?

59   0-20%
60   21-40%
61   41-60%
62   61-80%
63   81-100%

For the following questions, please answer what best suits your perception on a scale of 1 to 4, according to the guide presented in each question.

21. How much do you enjoy playing this game(s)?

64   1 (not at all / almost not)
65   2 (somewhat)
66   3 (considerably)
67   4 (extremely)

22. How difficult / complex was this game(s)?

68   1 (not at all / almost not)
69   2 (somewhat)
70   3 (considerably)
71   4 (extremely)

23. How important is it for you to read and listen to the content presented by the video game while you are playing?

72   1 (not at all / almost not)
In your opinion, what impact did playing this game(s) have in your reading comprehension skill in English?

1. (none at all / almost none)
2. (somewhat)
3. (considerable)
4. (extreme)

In your opinion, what impact did playing this game(s) have in your writing skill in English?

1. (none at all / almost none)
2. (somewhat)
3. (considerable)
4. (extreme)

In your opinion, what impact did playing this game(s) have in your listening skill in English?

1. (none at all / almost none)
2. (somewhat)
3. (considerable)
4. (extreme)

In your opinion, what impact did playing this game(s) have in your speaking skill in English?

1. (none at all / almost none)
2. (somewhat)
3. (considerable)
4. (extreme)

In your opinion, what impact did playing this game(s) have in your vocabulary in English?

1. (none at all / almost none)
2. (somewhat)
3. (considerable)
4. (extreme)

Have you played at least one of these games (IN ENGLISH)?

World of Warcraft series
Guild Wars series
Runescape series
League of Legends
World of Warcraft series, Guild Wars series, Runescape series, League of Legends (IN ENGLISH)

30. On estimate, what percentage of your total playing time have you spent playing this game(s)?

- 0-20% (No. of responses)
- 21-40% (No. of responses)
- 41-60% (No. of responses)
- 61-80% (No. of responses)
- 81-100% (No. of responses)

For the following questions, please answer what best suits your perception on a scale of 1 to 4, according to the guide presented in each question.

31. How much do you enjoy playing this game(s)?

- 1 (not at all / almost not) (No. of responses)
- 2 (somewhat) (No. of responses)
- 3 (considerably) (No. of responses)
- 4 (extremely) (No. of responses)

32. How difficult / complex was this game(s)?

- 1 (not at all / almost not) (No. of responses)
- 2 (somewhat) (No. of responses)
- 3 (considerably) (No. of responses)
- 4 (extremely) (No. of responses)

33. How important is it for you to read and listen to the content presented by the video game while you are playing?

- 1 (not at all / almost not) (No. of responses)
- 2 (somewhat) (No. of responses)
- 3 (considerably) (No. of responses)
- 4 (extremely) (No. of responses)

34. What importance do you give to talking/chatting IN ENGLISH to other human players within the game?

- 1 (none at all / almost none) (No. of responses)
- 2 (somewhat) (No. of responses)
- 3 (considerable) (No. of responses)
35. In your opinion, what impact did playing this game(s) have in your reading comprehension skill in English?

118  

☐ 1 (none at all / almost none)
☐ 2 (somewhat)
☐ 3 (considerable)
☐ 4 (extreme)

36. In your opinion, what impact did playing this game(s) have in your writing skill in English?

119  

☐ 1 (none at all / almost none)
☐ 2 (somewhat)
☐ 3 (considerable)
☐ 4 (extreme)

37. In your opinion, what impact did playing this game(s) have in your listening skill in English?

120  

☐ 1 (none at all / almost none)
☐ 2 (somewhat)
☐ 3 (considerable)
☐ 4 (extreme)

38. In your opinion, what impact did playing this game(s) have in your speaking skill in English?

121  

☐ 1 (none at all / almost none)
☐ 2 (somewhat)
☐ 3 (considerable)
☐ 4 (extreme)

39. In your opinion, what impact did playing this game(s) have in your vocabulary in English?

122  

☐ 1 (none at all / almost none)
☐ 2 (somewhat)
☐ 3 (considerable)
☐ 4 (extreme)

Please answer the following question ONLY if you have played games from more than one category presented:

- Category 1: FIFA series, Pro Evolution Soccer series, Call of Duty series, Halo series, Battlefield series
- Category 2: The Legend of Zelda series, The Elder Scrolls series, Final Fantasy series, Dragon Age series, Fallout series
- Category 3: World of Warcraft series, Guild Wars series, Runescape series, League of Legends

*
Which of the game groups had the greatest impact in your English skill acquisition? Please explain why briefly.

________________________________________________________________
________________________________________________________________
Beauty is in the eye of the gamer: to what extent do commercial games reinforce English as a second language acquisition?

Daniel Bolaños
Essi Vuopala
Faculty of Education, University of Oulu, Pentti Kaiteran katu 1, 90014, Oulu, Finland

Research has shown the potential of employing video game platforms for second language acquisition. Nevertheless, few studies have addressed the impact of non-educational commercial video games on second language learning as reported by the players themselves. This study aims at examining the player-reported impact of commercial video games on English language acquisition, in light of subjective gaming variables. 331 participants were asked to answer a questionnaire enquiring about their gaming practices and the impact they perceive video games to have on English as a second language (ESL) acquisition. Correlations between variables were found employing Spearman’s rho. Results show that players see a significant impact of different video game categories on ESL skills, based on subjective perceptions of gaming. Participants also suggest reasons why different gaming categories can have a greater impact on second language learning, and mention qualitative differences in language use influenced by diverse gaming practices. Findings from this study suggest that commercial games may indeed contribute to second language acquisition, in terms of reading, writing, speaking, listening, and vocabulary acquisition.

Keywords: human-computer interface, multimedia/hypermedia systems, teaching/learning strategies, commercial video games, English as a second language learning

Introduction

Contemporary trends see the rise of the Internet and digital platforms as dominant forms of interaction among children and teenagers. Through these channels individuals are able to exchange different kinds of resources while hanging out in a familiar context, generating an ideal space to practice a second language. Current schooling systems find themselves in need of presenting pedagogical alternatives with an increasing level of variability as a response to the wide offer of virtual resources learners may draw upon nowadays (Gee, 2003). These resources allow learner efforts to shift from mainly text-based methods toward a visual communicative input as a complement to traditional text-based learning, where learner-specific potential is exploited in pursuit of practical task realization. Said tasks work as an educational base for knowledge acquisition which is facilitated when presented in a concrete and intuitive fashion (Gee, 2005).

Commercial video games are extensively played by gamers worldwide (only in the United States an estimated 155 million people play video games) and are highly engaging, as evidenced in the contemporarily increasing numbers of gender-independent market participation and the emergence of professional leagues, which attract a massive attention from players and viewers (Entertainment Software Association, 2015). English is the preferred language of communication in gaming, which demands communicative skills from players whose mother tongue is not English, even if the sole purpose of commercial games is entertainment.

It would seem using a video game to convey second-language literacy can increase engagement in the student, providing an entertaining experience that spans activities
associated commonly to desirable core experiences in people (story, play, social, learning) (Purushotma, Thorne & Wheatley, 2008). Media typically include one of said activities - which are closely related to language utilization - attempting to highlight the attractiveness of the platform based on a single action, while disregarding the others.

Research has shown the educational benefits of using highly regarded “smart games” in areas such as sciences (Bolaños, 2013; Shute & Ventura, 2015; Young, 2010) and language learning (Smith et al., 2013; Lin, 2015; Aghlara & Tamjid, 2011; Sørensen & Meyer, 2007). However, research on non-educational games and their impact on language learning has not been widely addressed from the learner’s perspective.

Chen & Yang (2013) studied the impact of an adventure video game on foreign language learning. By assessing vocabulary acquisition prior to and after having played a video game, they concluded that there is a visible increase in terminology presented in-game. Going further, they observed positive attitudes from participants toward learning a foreign language through a commercial video game platform.

Corredor & Gaydos (2014) observed the affordances of massively-multiplayed video games on creating communities in which bilingual interaction is possible and mandatory. In these communities, second-language interaction serves an instrumental value to reach specific goals. In this paper the authors investigate how the situated nature of gaming contributes to the development of second language proficiency in non-bilingual contexts. They observe the use of the English language in common interaction between the gamers, and highlight the potential of massive multiplayer online role-playing games (MMORPGs) as a teaching tool in multicultural contexts.

Liu & Chu (2010) studied how using ubiquitous games in a listening and speaking English course influences learning achievement and motivation in high school learners. By immersing students into a ubiquitous learning environment while involving various educational strategies, such as context-aware learning and game-based learning, they found that incorporating games into English instruction yielded better learning outcomes and motivation than traditional classroom-based methods.

The link between video game experience and enjoyment has been studied previously, showing that the way players relate to the game, and the type of content the game presents, affects their perception (Shafer, 2014; Vorderer, Hartmann & Klimmt, 2003; Klimmt, Blake, Hefner, Vorderer & Roth, 2009). Learning through a video game is shown to be more rewarding and productive than employing traditional one-dimensional communication channels, due to the fact that players have a hand in determining the final outcome of the game. Lombardi (2012) affirms that humorous content embedded in games correlates with a higher learner motivation for language learning, since the player enjoys the comical experience while having to understand the humorous content linguistically, thus needing to delve deeper into language intricacies.

Research has also shown that game-perceived difficulty attributes have an effect on learning outcomes in game-based learning environments (Garris, Ahlers & Driskell, 2002; Orvis, Horn & Belanich, 2007). In general, challenges presented to gamers yield positive learning outcomes when the game presents challenges that are located at an optimal level of difficulty, in line with Vygotsky’s zone of proximal development (Vygotsky, 1987). When located at either side of the scale, learner motivation tends to diminish, as well as participation interest. Aiming to investigate whether commercial video game practice correlates with English as a second language (ESL) skill acquisition, the present study addresses the following research aims:

(1) Investigate how perceived degree of game complexity and perceived enjoyment in video games correlate with ESL skill acquisition.
(2) Establish a correlation between time spent playing specific video game categories and perceived ESL skill acquisition.

(3) Assess how content and playability of video games correlate with second-language learning.

(4) Investigate the impact human-to-human interaction has on ESL skill practice and acquisition in Role Playing Games (RPGs) and Multiplayer Online Battle Arena games (MOBAs).

Methods

Participants

Participants, both self-styled and not-self-styled gamers whose mother tongue was not English, were asked to fill out an Internet-based questionnaire. Individuals from 26 different countries participated, for which participation was clarified as voluntary and anonymous. From a total of 331 participants, 64.5% (N=213) were males and 34.8% (N=115) were females, with a mean age of 24.61 (SD=6.96). When asked whether they considered themselves gamers, 71.2% (N=235) of the participants stated they did. In terms of their education, 36.6% (N=121) of the participants reported they had attained at least a Bachelor’s degree. It is worth mentioning that the third quartile was on a Bachelor’s degree (item 4 of 7 on the scale), yielding a total of 80.6% of the participants (N=266) having attained a Bachelor’s degree, or less. Additionally, 95.1% (N=314) of the participants stated they had received formal English instruction.

Instrument and procedure

A questionnaire (see appendix A) was developed enquiring about game-related variables (e.g. game content, gameplay style, time spent playing, perceived enjoyment and complexity), and their correlation with perceived measures of influence on ESL skill acquisition. Questionnaires enquiring about player perceptions toward games and language gains from their practice have been used previously, e.g. Chen & Yang (2013). The questionnaire was shared via email and social networks over a span of 12 days. There was one open question for participants who had played games within more than one category, from a total of three (see table 1 below). This question aimed to determine self-reported advantages, challenges, and other details that underlay second-language acquisition within video game settings in both single and multiplayer contexts. Answers could prove fundamental as a pilot study for bridging the results with a future in-depth analysis.

Characterization of a few selected video games within set categories

The games used in the present study were selected according to a specific classification based on variables such as gameplay type and pace, game content and content complexity, and in-game reading/interaction quality. In line with the aims for the present study, correlations between the three game-related variables (time spent playing, perceived enjoyment and perceived complexity) and language acquisition were studied, as reported by the players. The games selected for the present study are commercial, highly popular games that have received critical acclaim over the years after their release. Table 1 shows the video games selected for the present study.

<table>
<thead>
<tr>
<th>Category 1 Games: fast-paced action and sports</th>
<th>Category 2 Games: single player (offline) RPGs</th>
<th>Category 3 Games: online RPGs and MOBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIFA series</td>
<td>The Legend of Zelda series</td>
<td>World of Warcraft</td>
</tr>
<tr>
<td>Pro Evolution Soccer series</td>
<td>The Elder Scrolls series</td>
<td>League of Legends</td>
</tr>
</tbody>
</table>

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Participants understood that no game could belong to more than one category simultaneously, as categories were designed to be mutually exclusive and were presented as such in the questionnaire. All games within each series were contemplated in the analysis, where applicable (e.g. only offline versions of Final Fantasy and The Elder Scrolls were counted for Category 2). Table 2 introduces a brief characterization of some of the games employed, and a description on elements of analysis present in each game category.

<table>
<thead>
<tr>
<th>Game</th>
<th>Description</th>
<th>Gameplay type, game content, ingame reading/interaction type/quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIFA (1993-)</td>
<td>A commercial success, this highly competitive football simulation game enables gamers to control a team of their choice with players that correspond to real life professionals and compete against either the CPU or other gamers. A new installment is presented every year, making it a staple in sports fans, and a profit powerhouse.</td>
<td>Fast-paced games, both sports and action require from the players decision taking over tightly scripted scenarios, without having a significant effect on game progression and experience. Players receive simple prompts and other audio input which are not usually vital to game progression. Presented vocabulary is usually limited and context-specific. These games do not require an ample reading comprehension skill. No interaction with other human players.</td>
</tr>
<tr>
<td>Call of Duty (2003-)</td>
<td>A member of the very popular FPS (first-person shooter perspective) genre, this game allows players to progress through a set campaign with varying levels of difficulty, where the objectives are to employ infantry tactics to win battles with conventional weaponry. From its original release, it has kept a steady presentation of new installments.</td>
<td>Presented vocabulary is usually limited and context-specific. These games commonly require attentive reading and/or listening for progressing. No interaction with other human players.</td>
</tr>
<tr>
<td>The Legend of Zelda (1986-)</td>
<td>Originally intended to be a fairy tale story following the hero-saves-princess theme, it has evolved over the years as an adventure RPG, introducing attractive visual effects through casual gameplay.</td>
<td>Not typically fast-paced, offline RPGs require from the players decision making over loosely scripted scenarios, where decisions have a significant effect on game progression and experience. Players receive simple/complex prompts and other audio input which are normally vital to game progression. Presented vocabulary is wide and not necessarily context-specific. These games commonly require attentive reading and/or listening for progressing. No interaction with other human players.</td>
</tr>
<tr>
<td>Elder Scrolls: Skyrim (2011)</td>
<td>One of the most representative games in the sandbox, open world offline RPGs, this game presents a universe as open and enticing as the player wants it to be, along with an extensive lore of historical affairs within its fictional world. It uses the contemporarily popular randomly generated content algorithm, making it virtually endless in terms of game objectives.</td>
<td>Both slow and fast-paced, online RPGs require from the players decision making over loosely scripted scenarios, or completely unscripted scenarios, where decisions have a significant effect on game progression and experience. Players receive both simple and complex prompts and other audio input which are normally vital to game progression. No interaction with other human players.</td>
</tr>
</tbody>
</table>
World of Warcraft (2004-)

Considered by many as the epitome of online gaming, this MMORPG enables the player to control a fully unique fantasy character and live within an immense game world rich in lore and game objectives. Social play lies at its core, requiring constant interaction with other players in order to fully exploit the game mechanics and capabilities.

**Analysis**

Data from three distinct game categories was recorded and analyzed independently using the SPSS 22 software platform. A quantitative analysis was utilized showing independent variable measures and correlations between variables to obtain a detailed picture of participants’ responses. Since no assumptions can be made about probability distributions due to the fact that the outcome is an ordinal variable for all cases, the nonparametric Spearman’s rho test is employed in the analysis, nevertheless taking statistical advantage of the broad amount of questionnaire respondents (Gibbons & Chakraborti, 2011).

Each of the following variables was measured three times, once per gaming category. Variables enquiring about game-related information were the following:

4. Fraction of total playing time (in percentage) per game category.
5. Perceived degree of enjoyment of gaming experience within a specific game category.
6. Perceived level of complexity of each game category.

The five main skills associated to ESL were selected as variables, with independent measurements per each of the three gaming categories:

6. Perceived impact of gaming experience on reading comprehension.
7. Perceived impact of gaming experience on writing.
8. Perceived impact of gaming experience on listening.
10. Perceived impact of gaming experience on vocabulary acquisition.

All variables were assessed employing Likert scales with 4 items, except fraction of total playing time (with a Likert scale of 5 items).

**Results**

From all the participants, 62.8% (N=208) played games from category 1 (sports and first-person shooters); 54.0% (N=179) played games from category 2 (single player offline
RPGs); and 42.2% (N=140) played games from category 3 (online RPGs and MOBAs). Responses from participants that had played more than one game category were recorded independently. Figure 1 shows the measures of game-related variables in player reports within the three video game categories.

![Figure 1: Independent measures for independent variables](image)

Participants were asked to grade the perceived impact of game-related variables on five ESL skills. Table 3 shows the perceived impacts of playing games on the five ESL skills, in each of the three game categories. The frequency of scores obtained in the questionnaires for each of the 5 ESL skills is shown.

<table>
<thead>
<tr>
<th>ESL Skills</th>
<th>Game Category</th>
<th>Frequency of scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>1</td>
<td>27.5%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>15.8%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>40.8%</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>23.2%</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>20.6%</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>15.0%</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>13.1%</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>19.6%</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>33.7%</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>29.6%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>26.8%</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>14.4%</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>6.1%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>12.1%</td>
</tr>
</tbody>
</table>

Table 3: Frequency of scores per ESL skill impacts within each game category.
Correlations were found between the three game-related variables (percentage of total playing time spent within each game category, perceived degree of enjoyment within the game category, and perceived level of difficulty/complexity in each game category) and the perceived impact of play on five ESL skills. The employed correlation coefficient was the nonparametric Spearman’s rho. Correlations were reported in groups, considering the large amount of variables. Tables 4, 5, and 6 show the correlations between said variables for games belonging to each of the three categories.

Table 4: Correlations for Game Category 1 (first-person shooters and sports)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent with category 1 games</th>
<th>Perceived enjoyment</th>
<th>Perceived level of game complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Reading</td>
<td>.373</td>
<td>.301</td>
<td>.050*</td>
</tr>
<tr>
<td>Writing</td>
<td>.247</td>
<td>.249</td>
<td>.045*</td>
</tr>
<tr>
<td>Listening</td>
<td>.347</td>
<td>.318</td>
<td>.049*</td>
</tr>
<tr>
<td>Speaking</td>
<td>.335</td>
<td>.310</td>
<td>.007*</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.283</td>
<td>.197</td>
<td>.043*</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01; *non-significant

Table 5: Correlations for Game Category 2 (offline role playing games)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent within category 2</th>
<th>Perceived enjoyment</th>
<th>Perceived level of game complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Reading</td>
<td>.360</td>
<td>.382</td>
<td>.327</td>
</tr>
<tr>
<td>Writing</td>
<td>.353</td>
<td>.354</td>
<td>.297</td>
</tr>
<tr>
<td>Listening</td>
<td>.269</td>
<td>.299</td>
<td>.332</td>
</tr>
<tr>
<td>Speaking</td>
<td>.278</td>
<td>.323</td>
<td>.326</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.336</td>
<td>.383</td>
<td>.294</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01

Table 6: Correlations for Game Category 3 (online role playing games and multiplayer online battle arena)

<table>
<thead>
<tr>
<th>Skill impacts</th>
<th>Percentage of total play time spent within category 3</th>
<th>Perceived enjoyment</th>
<th>Perceived level of game complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Reading</td>
<td>.421</td>
<td>.490</td>
<td>.369</td>
</tr>
<tr>
<td>Writing</td>
<td>.438</td>
<td>.487</td>
<td>.334</td>
</tr>
<tr>
<td>Listening</td>
<td>.359</td>
<td>.479</td>
<td>.370</td>
</tr>
<tr>
<td>Speaking</td>
<td>.399</td>
<td>.500</td>
<td>.396</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>.430</td>
<td>.478</td>
<td>.353</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01

At first glance, according to tables 4, 5, and 6 there are moderately strong, positive correlations between the three game-related variables and the five language skills (with the
exception of perceived level of game complexity for game category 1 across the five language skills). Thus, it can be concluded that game-related variables have a correlation with ESL skills, in line with research aims (1) and (2).

To obtain a wider perspective on the impact of gaming on language skills in terms of whole game categories, it becomes necessary to scale out the level of analysis and study the differences among the game categories in terms of game-related variables (e.g. content and playability) and ESL skill acquisition. Table 7 presents a summary of the correlations obtained per each game-related variable, per game category.

Table 7: Summary of correlations for perceived ESL skill impacts per game category

<table>
<thead>
<tr>
<th>Game Category</th>
<th>Percentage of Time spent</th>
<th>Perceived enjoyment</th>
<th>Perceived level of game complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Mean r</strong></td>
<td><strong>Mean r</strong></td>
<td><strong>Mean r</strong></td>
</tr>
<tr>
<td>Category 1</td>
<td>.317</td>
<td>.275</td>
<td>.038*</td>
</tr>
<tr>
<td>Category 2</td>
<td>.319</td>
<td>.348</td>
<td>.315</td>
</tr>
<tr>
<td>Category 3</td>
<td>.409</td>
<td>.487</td>
<td>.364</td>
</tr>
</tbody>
</table>

All correlations significant at p<0.01; *non-significant

The strength of the correlations varies between categories, which suggests that elements of content and playability also correlate with ESL skill acquisition, in line with research aim (3). According to the results, players perceive an increased impact in language acquisition when game pace and scripting diminish, and narrative content increases.

A comparison between the mean correlations between game categories 2 and 3 shows that human interaction determines an increased perception of impact in language acquisition. Since categories 2 and 3 are largely similar in terms of gameplay pace, content and type of narrative, it can be concluded that the difference comes as a result of human interaction, in line with research aim (4).

Discussion

Highly popular, commercial video game practice correlates with ESL skill acquisition when pairing it with gameplay-related variables, subjective experiential variables, and time spent playing. After conducting the data analysis, the hypotheses were proved for the majority of cases (see tables 4, 5, and 6), in line with other studies that have found similar evidence regarding second language acquisition (Lin, 2015; Aghlara & Tamjid, 2011; Sørensen & Meyer, 2007; Chen & Yang, 2013; Corredor & Gaydos, 2014). Still, further research is required in order to observe in greater detail how different measurements of game-related variables correlate with ESL skill acquisition (e.g. a greater time spent playing yields greater ESL skill acquisition). Also, a broader study should be conducted to establish the correlation between background variables such as age, education, nationality, and gender in game experience and ESL skill acquisition.

According to the findings in the present study, there is a positive correlation between game enjoyment and ESL skill acquisition. In line with Schafer (2014), by whom player skill at the game affects the degree of enjoyment, a greater benefit at ESL skill acquisition could be reaped by studying varying degrees of game-related skills in the players (e.g. the more a player manages to progress in an adventure game, or the more goals a player scores due to ability, the better the resulting ESL skill acquisition). Observed correlations between enjoyment and ESL skill acquisition parallels Lombardi’s findings (2012), by which gaming
enjoyment comes as a result of variable game narratives and content types, which in turn increases motivation for language acquisition in players with specific tastes.

In terms of game complexity, results show in general that it correlates with ESL skill acquisition. This suggests that players perceive variations in difficulty as beneficial for language acquisition, in accordance to Garris, Ahlers & Driskell, (2002) and Orvis, Horn & Belanich, (2007). Nonetheless, for games belonging to category 1 (fast-paced sports and first person shooters), a different level of reported complexity in the game experience does not correlate with significant impacts on ESL skill acquisition. Taking into consideration that this same measurement did yield positive correlation for the other two game categories, it could be suggested that when there is little time to assimilate what language content the game has to present, or when said content is not crucial to game progression, varying the challenge level of the game does not represent gains in language learning. On the other hand, it could be stated that the level of concentration a fast-paced video game usually requires is proportional to its difficulty; thus, a greater level of difficulty could require ample cognitive resources, potentially hindering language acquisition.

To observe how each game category contributes independently to ESL skill acquisition in terms of game content and playability, a comparison of average correlations per ESL skill was run. Results (see table 7) show minimally stronger correlations in category 2 (offline RPGs) than in category 1 (sports and shooters), not yielding significant enough differences (other than the fact that there was no significant correlation between perceived complexity and any of the ESL skills for category 1). Player perception of ESL skill acquisition varies negligibly between sports and shooters, and offline RPGs. This could suggest that the perceived impact on ESL skill acquisition does not necessarily depend on game pace and complexity of introduced prompts and dialogues. Whereas the benefit of employing role playing games to support ESL skill acquisition was shown, in line with Cornillie, Clarebout & Desmet (2012), future research should aim at establishing increasingly specific differences between the two game genres in terms of language content. Nevertheless, category 3 showed relatively stronger correlations than the other two game categories. The presence of human-to-human interaction in online RPGs and MOBAs appears to increase the perceived impact game practice has in ESL skill acquisition. Players within category 3 are presented with human-to-human interaction in addition to CPU-to-human interaction, widening the experience of second language through non-standard communication practices such as code-switching, abbreviations, and alternative grammars, and an extensive context-exclusive lexicon. It is especially relevant to point out that the difference between game categories 2 and 3 is mostly dependent on human mediation, since game mechanics and content are similar at large. The added complexity to linguistic usage, vocabulary, and non-standard language practices, for example, could play a role in making players perceive their gaming experience as supportive to their language learning. Further research could provide insights on the role of human mediation when within the same game in both offline and online settings. Even more, benefits and risks of learning a second language in bilingual communities producing non-standard language practices in commercial games could be studied, further extending Corredor’s & Gaydos’s (2014) research into educational video games.

Since all data gathered for the present study was based on self-reports drawn from video games whose aim is not educational, no generalization can be made for educational video games. Additional research on self-reported impact of educational video games in language learning based on the variables employed in the present study would prove useful in establishing contrasts between players’ perceptions of ESL skill acquisition according to the purpose of the game. Likewise, placing commercial video game practice in parallel to
traditional classroom-based teaching methods could be observed in order to find ways in which differential language teaching methodologies can complement each other.

Performing a qualitative analysis via interviewing participants that have played the three game categories could widen the understanding on the intensity and the nature of the impact of games on ESL skills, looking for divergence in terms of language quality/formality and the usage of abbreviations, acronyms and contractions, for example. Analyzing types of interaction across video game-mediated channels (e.g. within the game itself or in gaming-related forums) could also provide insights on how video games and video game-related content correlate with differential ESL skill acquisition levels. In parallel to this, a qualitative analysis on subjective variables employed in the present study would allow for a more in-depth comprehension of what participants perceive as being a gamer, as enjoying a game, or as perceiving it complex, and how these mediate in ESL skill acquisition. Further study could provide insights on the depth, pertinence, and transferability of second-language skills acquired in domain-specific contexts introduced by the video games.

When designing the questionnaire, games per category were selected on popularity and widespread acclaim; nevertheless, this does not mean that participants play those games exclusively. Some participants reported through the open question having played games from entirely different categories from those presented in the present study (or having played games that belong to more than one category simultaneously, such as the first-person shooter/RPG Borderlands). Several participants commented on other game genres with a reported high impact on ESL skills, such as Real Time Strategy games (e.g. Starcraft, Age of Empires) and Life Simulation games (e.g. The Sims). Further study could provide useful insights into the nature and quality of language acquired through other video game genres.

Conclusion

This study investigated the effects of commercial video games on English skill acquisition in parallel to subjective game experience variables, game type and gameplay style, and time spent playing, according to players’ self-reports. The results of the study have yielded several interesting findings. First, based on an individual questionnaire, it has been shown that there is a correlation between ESL skill acquisition and subjective gaming experience and time spent played. Players perceive commercial video game practice as a positive way to improve their English reading, writing, listening, speaking and their lexicon. Second, different game categories yield diverse correlations between game-related variables (game enjoyment, complexity, and time spent playing) and ESL skill acquisition. These findings further show the potential of video games as an educational tool in second-language learning, and should encourage further research into how and to what extent commercial video games should be employed in supporting second-language learning in technology-mediated contemporary society. Likewise, these findings can assist game design to go further and design both educational and non-educational video game content in such a way that language development potential is maximized while keeping the platform attractive enough for players to be engaged and have legitimate fun in its practice. For one, linking game progression with even tighter scripting in fast-paced games could guarantee that players read through and listen to the text presented in-game. In an analog fashion, increasing the frequency of text and audio content presentation in online RPGs (and augmenting the complexity of content presented) could spur players to use game-acquired language more strictly. That way, a more systematic educational approach would be employed to introduce players to specific forms of language and lexicon. Finally, considering that offline RPGs are almost exclusively story-driven, games could be further designed drawing from
contemporary common usage of the language, to maximize the transferability of lexicon and language usage players acquire through play.

Appendices

A. Questionnaire published through Webropol in PDF form

References


