

Gaming for Grades:

Gaming as a Pastime, School Performance and Self-efficacy

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Abstract

Playing video games has become an increasingly popular way of spending leisure time, especially among youth, in the Netherlands. It is not without its controversies: children may be prone to addiction and spend less time outside. On the other hand, it may also have its benefits: scientific literature suggest, among others, increased problem-solving skills, a larger vocabulary, and increased literacy. Additionally, it may be the case that various types of games may have different effects on the various language skills: online gaming, for instance, involves social interaction and thus may improve conversational skills such as listening and speaking. The goal of this study was to examine a potential relationship between playing video games as a pastime and school performance, to examine differences between types of games and the relationships with the various language skills, and to examine a potential mediating effect of self-efficacy on the relationship between gaming and school performance.

This study investigated gaming behaviour among 154 children in secondary school aged approximately fifteen years old. Their school grades were compared to their gaming behaviour, as well as their self-efficacy, which were based on self-report via a questionnaire, in relation to English class and tasks.

Group comparisons showed that gamers outperformed non-gamers in mean English grade, listening tests and reading tests. Also, a significant mediating effect of self-efficacy was found on the relationship between gaming and school performance. Additionally, it was found that playing video games and scores for listening tests significantly correlate. Finally, both voiced as well as written communication online seem to have a significant positive correlation with mean grades for English.

Further studies may examine the nature of these relationships and determine potential causal relationships. In the end, positive relationships and/or effects may show a potential role for implementing video games as a means to learning a language.

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Introduction

In the Netherlands, playing video games is a very common pastime. In 2017, 35 percent of primary school students and over 27 percent of 12 to 16 year-old students play video games on a daily basis. Of the latter group, 11 percent also spends at least four hours each day on this pastime (“Gamen”, 2019). In mass media, there is a lot of attention in regard to problematic gaming behaviour, such as addiction. In 2015, 3.3 percent of secondary school students showed risky behaviour in regard to gaming, more common in boys than girls. A similar study by the Health Behaviour in School-aged Children (HSBC) showed similar results in 2017.

Albeit dated, a study in 2009 also showed that approximately 9.3 million people in the Netherlands play video games, which is reportedly equal to 70 percent of the “Dutch online population” (Van Den Broek, 2009). They report 98 percent of all children to play video games at some point, on average for six hours per week.

Although gaming as a hobby may be stigmatised by some, and the fear of addictive behaviour may be realistic, there have also been studies that have shown positive effects of playing video games. For instance, it has been suggested that video games may not elicit aggressive behaviour, as previously thought, because increased aggressiveness only showed in children showing risky gaming behaviour and was only limited to specific types of games (Poppelaars, 2015). Additionally, the idea that ‘a gamer’ has a limited social life and reduced social skills as a result also seems an archaic assumption: social behaviour seems to be positively influenced even in games aggressive in nature, if they are played cooperatively (Poppelaars, 2015). Furthermore, Poppelaars (2015) as well as Druglijjn (a Belgian website covering a range of behaviours and habits) mentioned increased problem-solving strategies, benefits to reaction times, cooperative problem-solving, and improved concentration and determination.

Finally, a Swedish article (Sundqvist & Wikström, 2015) also has come to light in the Netherlands. It suggests that gaming as a pastime positively influences L2 English vocabulary learning. Gaming provides a certain degree of immersion in the English language, which will be discussed later, and as such it seems interesting to examine the aforementioned information a little further, and to attempt to gain more insight in the effects of gaming, specifically on the acquisition of English as a second language. Educational games exist, and implementation may prove beneficial to educational settings, such as in regard to motivation (“fun and challenging”) as well as in relation to academic behaviour (better at homework, transfer of vocabulary acquisition to free-form writing assignments) (Neville, Shelton, & McInnis, 2009). However, based on the information mentioned in this introduction, this study focuses mainly on commercial games played in leisure time, since this is an extremely common pastime in the Netherlands and an interesting area still to be explored further. In addition, playing video games in leisure time means that the activity was actively chosen by the player. In other words, the player was intrinsically motivated to play video games simply due to the fun nature of the activity itself. This idea will be further explored in the theoretical framework, but also serves as a reason to study these commercial games, rather than educational games, since this study will also examine the role of self-efficacy, which has strong ties with motivation. This will also be explored further in the theoretical framework.

Theoretical Framework

In the literature, there have been many discussions about the effects of playing video games on the development of English as a second/foreign language in children (e.g. Chen & Yang, 2013; Chik, 2014; Gee, 2003, 2005; Sylvén & Sundqvist, 2012). For instance, Gee (2003, 2007) has studied the relation between (good) video games and learning, and argues that good games incorporate opportunities for the player to learn, for example, ways of problem solving. Studies into gaming as a learning tool that focus more on second/foreign

language acquisition include deHaan's (2005) research on the acquisition of Japanese by means of a baseball video game, as well as Ranalli's (2008) study of second language vocabulary learning through the popular *The Sims* game. deHaan (2005) conducted a one-month study with one intermediate learner of Japanese as a foreign language, and suggested that playing the video game facilitated language acquisition through the controllable nature of the video game (i.e. pause the game to read) and through simultaneous aural and textual exposure. However, the study was mostly based on self-report and included only one participant (p. 282). Ranalli's (2008) study implemented the *The Sims* game as supplementary materials for university-level ESL learners, and found that players significantly improved their vocabulary knowledge, and had overall positive reactions towards using the game as a means to learn. Despite the relatively small sample size and the reliance of self-report the findings are still interesting, since they do not only show an increase in vocabulary knowledge, but also in enjoyment, which could affect motivation.

This study will examine the effects of playing video games on EFL proficiency, and will also examine the role of self-efficacy in this interaction. The study will solely focus on *commercial off the shelf* (COTS) games (Whitton, 2010, cited in Chik, 2014). This way, the focus is entirely on gaming as a pastime, and not on gaming with educational purposes, as the latter serve the purpose of increasing one's language skills (regardless of the location where the game is being played), whereas this study focuses on incidental learning through out-of-school exposure.

The following section will discuss some theoretical frameworks related to these concepts, after which the research questions and hypotheses are introduced.

Video Games and Language Proficiency

One positive effect of playing video games on language acquisition is that it seems to increase literacy and understanding (Gee, 2003). Gee studied several children playing the

game *Age of Mythology*, a real-time strategy game set in a mythological era featuring Egyptian, Greek and Roman, and Norse mythologies. Besides being highly motivational in its design by offering challenging scenarios to be overcome, it also seems to have an effect on the knowledge of the player on the subject involved, in this case ancient mythology. Several of these children were also reported to have spent additional time browsing the web looking for information on the topic.

Another effect, shown by Chen and Yang (2013) is the acquisition of L2 vocabulary items through playing an adventure game. Chen and Yang used the adventure game series called *BONE*, and found that vocabulary acquisition occurred whilst playing the game. Although results from this study are interesting, the pre-test and post-test of this study were both targeted towards items that appeared in the game, and no control group was included. However, Chen and Yang did examine the effects of using a specific learning strategy: note taking. Their first experimental group was required to play the game while not taking notes, whereas the other group had permission (but no obligation) to take notes of unknown words. They found no significant effect of note taking on vocabulary acquisition, which suggests that incidental learning through out-of-school exposure may occur during – in this case text-heavy – video games.

The study by Chen and Yang (2013) focused on vocabulary acquisition and Gee (2003) focused mainly on literacy. However, the former study focused on an offline, singleplayer¹ adventure, and the latter functions more as an essay regarding the role of various games in general psychological theories and how those theories may come to fruition through playing video games. To examine only the aforementioned type of games would be to ignore what have been the biggest games over the past few years: online multiplayer games. These

¹ Singleplayer games are games with just one player.

will be subdivided into two categories, Massively Multiplayer Online Roleplaying Games and match-based online multiplayer games, and discussed below.

MMORPGs & Match-based Multiplayer Games

Firstly, Massively Multiplayer Online Roleplaying Games (MMORPGs) are games that feature a giant online world inhabited by thousands of players simultaneously, who (need to) interact with each other in order to progress through the game. Examples include *World of Warcraft* (released in 2004 and still running), *Guild Wars 1* and *Guild Wars 2* and *Final Fantasy XI* and *XIV*. Characteristics of these games include large open areas, bustling city hubs and lots of options with regard to character progression. Players start the game by creating a character, whose career they will decide over the course of the game as well as during character creation. At the endgame stage, often after the game's story-related missions have been completed by the player, players engage in group-focused activities, which range from smaller four-to-five-player 'dungeons'² as well as large-scale twenty-five-player 'raids'³. A lot of communication is done via written chat by means of 'chatboxes', though third-party software is also often used to enable voice communications, especially when the players already know each other.

Although literacy may be improved by means of playing these games, as they are still relatively text-heavy, communication with other players, especially during the aforementioned endgame phase, may be even more centric. Sundqvist (2009) found positive effects of playing video games on L2 proficiency, in particular regarding vocabulary knowledge, in Swedish

² Content where players clear monsters and progress through several boss fights in order to obtain better equipment for their characters.

³ Same as above, but much larger in scale and duration to complete, and boss fights usually require a thorough knowledge of game mechanics and intensive communication.

ninth graders. Based on these findings, Sylvén & Sundqvist (2012) have studied the effects of playing MMORPGs on Swedish fifth graders' L2 proficiency and found that frequent gamers outperformed non-frequent gamers, who in turn outperformed non-gamers. However, they did not control for several external factors such as aptitude, general cognitive ability and also were unable to “control the learners' level of L2 English proficiency prior to their involvement in extramural English activities such as digital games” (p. 314). Despite these missed opportunities, their findings are still very interesting and warrant future research, since the exact nature of the effects of gaming on L2 English proficiency is not quite clear. For instance, effects on particular language skills of various game genres have not been studied. Another interesting finding is that playing *World of Warcraft* had a bigger effect on L2 reading comprehension than for example the effect of L1 reading comprehension. This indicates that perhaps the effects of gaming on L2 acquisition should not be underestimated, and it would be interesting to examine whether similar effects can be found on the other skills (listening, writing, and speaking).

Match-based multiplayer games are games that feature shorter or longer matches, but not a persistent world. They often include a ‘main screen’ with several options to play, and when a player wants to play a match, the player joins a digital queue. After that, they are added to the match, which can be five versus five strategy games, one versus one, or larger sixty-four person shooting games, but are commonly not larger than that. Communication during these games is often done by voice chat, since they tend to be more action-focused and fast-paced than MMORPGs⁴ and may as such provide less time for written chat to be effective.

⁴ Although the hard endgame content in MMORPGs also requires quick and effective communication.

Based on the findings by Sundqvist (2009) and Sylvén and Sundqvist (2012) it could be expected that increased amount of time spent playing video games will result in a higher L2 proficiency, especially regarding vocabulary. However, as discussed before, there is a big difference in setup when comparing offline singleplayer games and online multiplayer games. The former may be much more text-heavy, resulting in a lot more time spent reading, whereas the latter may elicit much more communication. As such, one of the things the present study aims to determine, is the relationship between playing video games and the different language skills: reading, writing, listening, and speaking.

Although the aforementioned language skills may not have been related to various types of games, Sundqvist (2013) has made an attempt to categorise these various types of games by examining the degree of social interaction within these games, and has set up the SSI Model. The SSI Model is an abbreviation for “the scale of social interaction model. Its goal is to support researchers attempting to examine commercial-off-the-shelves (COTS) games in quantitative studies. As such, this may be a valuable tool for the current study and warrants closer examination. Sundqvist starts by criticising already existing models, such as Kinzie and Joseph’s (2008) model, which uses six types of activities to describe gameplay: “Active, Explorative, Problem-solving, Strategic, Social, and Creative play” (cited by Sundqvist, 2013, p. 90). Sundqvist notes, correctly, that some games might fall into multiple, or all categories, and gives the example of *World of Warcraft*, which features all of the aforementioned gameplay activities. deHaan (2005b) also provides a similar type of model to Kinzie and Joseph’s (2008), but it encounters the same issues: games falling into multiple categories.

The SSI model uses just one variable: “the scale of social interaction in the game [which] is directly related to the number of players who are involved in simultaneous gameplay” (Sundqvist, 2013, p. 90). As described before, video games can be roughly

categorised into three types: singleplayer, multiplayer, and massively multiplayer online (roleplaying) games (MMORPGS). Sundqvist uses this categorisation, but notes, importantly, that while secondary school children often play multiplayer games together after class, it is also entirely possible to play singleplayer games together, for example by taking turns or by tackling problems cooperatively, even though only one player is controlling the game. MMOs are said to have the most established social environment, in the sense that thousands of players join in the same world, which features “strong support for creating and sharing creations with others, some type of informal mentorship whereby what is known by the most experienced is passed along to novices, and finally, with members who feel some degree of social connection with one another (Jenkins, Purushotma, Weigel, Clinton & Robinson, 2009, as cited by Sundqvist, 2013, p. 92).

The score of this model is determined as follows: “the larger the scale of social interaction offered by particular digital games, the higher the chances of encountering co-players of different nationalities and, as a consequence, the obvious need for a shared language among the players” (Sundqvist, 2013, p. 94). It should be mentioned that the default language used for these interactions is English. A higher SSI score means involvement in “authentic oral as well as written English game interactions” (p. 94). Although this may generally be the case, one pitfall is still the assumption that each player is involved in the game in all of its potential aspects. However, Sundqvist works around this by describing this as “potential for learning English” (p. 94). Furthermore, Sundqvist describes these games to be positioned on a continuum from singleplayer games having the lowest SSI scores, to MMOs having the highest, suggesting that MMOs are more beneficial to language learning than singleplayer games. However, for the current study, the various language skills will be taken into account, so a higher amount of time spent playing MMOs as compared to singleplayer games may be a predictor for communicative language skills based on the SSI

model, some singleplayer games may still feature a lot of time spent reading. As such, the current study will examine which games are being played and what the behaviour of the player is in those games.

As an example, although *World of Warcraft* scores extremely high on the SSI model due to its massive nature, not all players reach endgame, or some players may only communicate or be involved with (groups of) friends playing content together, rather than international groups. For these reasons, this study will also include questionnaires which attempt to provide more insight into actual gaming behaviour and activities that may lead to language learning by means of either more input, or social interactions in English. Additionally, it should be mentioned that although the framework of Sundqvist's (2013) study is interesting and very useful, its results, that is the games being categorised, will change severely over time, as new games are released and old games obsolete or forgotten. In other words, this list warrants continuous monitoring, since it is prone to becoming dated. For instance, games included are *Age of Empires Online*, which has been shut down, and other old games which likely are unfamiliar to children in primary and secondary schools right now. However, the most popular games, such as *Call of Duty*, feature a very long series of annually released games. Additionally, new games as well as genres that are released need to be examined too. For instance, the "Battle Royale" genre (*PlayerUnknown's Battlegrounds*, *Fortnite*), where, usually, a hundred players are dropped on an island with the goal to be the lone survivor, and thus to kill every other player, are not taken into account yet, and may be described as singleplayer (since everyone has their own goals and in some games communication may not even be possible) or multiplayer (since they can be played in squads). And although a hundred players are included, it cannot be described as an MMO, since players do not cooperate in large groups and the goal being the last (squad) standing does not facilitate cooperative gameplay in such large-scale a way either.

Self-efficacy

One aspect that has not been studied yet regarding the relationship between playing video games and EFL proficiency is that of self-efficacy. Bandura (1994) defines self-efficacy as the beliefs people have “about their capabilities to produce effects” (p. 1). In other words, perceived self-efficacy describes a person’s thoughts about their ability to perform a specific task successfully. One might expect that voluntary exposure to the L2 – in this case through video games – may increase a learner’s self-efficacy. For instance, it may result in phrases such as: “I’m good at English because I play so many video games”, or “English is all around me because I play a lot of video games”. This study will also attempt to inspect the mediating relationship of self-efficacy and its effects on the relationship between playing video games and EFL proficiency. Although the implementation of video games in the EFL learning process may increase motivation (Ranalli, 2008), there has been no research into the role of self-efficacy specifically and the relationship between proficiency and gaming during leisure time. As such, this study will approach this exploratively. In addition, the relationship between self-efficacy and motivation will be discussed below, as well as the relationship between self-efficacy and language proficiency.

Self-efficacy and Motivation

Self-efficacy can be seen as one of many factors influencing motivation. Various theories of motivation have assigned different roles to the influence of self-efficacy as well. For instance, in social cognitive theory, self-efficacy is described as a personal variable that both influences, and is influenced by, achievement outcomes as well as social influences (Schunk, 2004; Schunk & Pajares, 2009). Achievement outcomes include goal progress, degree of learning, as well as motivation. Social influences are related to the environment in which a pupil lives, and include models, instruction, and feedback. An example of such an interaction is the feedback given by a teacher, which influences the goals a pupil may set. The

goal set by the pupil is also based on internal factors, such as the pupil's beliefs about his own capabilities. A realistic goal, which is subsequently reached by the pupil, will result in a positive experience, which increases the pupil's motivation. These experiences are described as mastery experiences, and positively influence both self-efficacy and motivation as a whole (Schunk & Pajares, 2009).

The concept of motivation is strongly related to academic performance as such that having a higher degree of motivation positively affects academic performance (e.g. Woolfolk, Hughes, & Walkup, 2013). Motivation can be defined as "an internal state that arouses, directs and maintains behaviour" (Woolfolk, Hughes, & Walkup, 2013, p. 430). It affects choices made to behave a certain way, how long it takes to start a certain task, and whether to give up or to persist. It is further divided into intrinsic motivation and extrinsic motivation (Deci & Ryan, 2002). When a person is engaged with a task they find rewarding on its own, that person is intrinsically motivated. In other words, this person does not need an external reward, such as payment, in order to be motivated for the task. On the other hand, when a person is engaged with a task, they may be extrinsically motivated because they were promised a payment or want to avoid punishment. Extrinsic motivation usually has very little to do with the task itself (Deci & Ryan, 2002). This is relevant for the current study, since language learning may occur when engaging with video games, an activity that is performed based on intrinsic motivation.

In addition, especially in online videogaming, motivation may be enhanced through integrative motivation. Gardner (2001) discusses this in the context of the socio-educational model of second language acquisition, in which Gardner adopts three variables: "integrativeness", "attitudes towards the learning situation", and "motivation" (pp. 5-6). Integrativeness is described as the desire to become a part of the target language community, ranging from openness to that culture to complete identification. Attitudes towards the

learning situation involves anything related to that situation, ranging from attitudes towards the teacher, the course in general or the materials. Gardner (2001) describes motivation as the “driving force” in any situation, and generally fits the previously discussed definition by Woolfolk, Hughes, and Walkup (2013) as an internal state that drives behaviour. All three variables need to be present in order for learning to occur, as simply being open to a culture, without being motivated to learn, will not result in (effective) learning.

Online video games offer a great platform in which to practice the open attitudes towards people with different nationalities. Especially cooperative video games allow players to communicate with one another and to become friends if they so desire, further promoting integrativeness. However, this on its own, as Gardner (2001) also argues, is not enough to facilitate language learning. In other words, simply wanting to engage with speakers of foreign languages is not a guarantee of actually becoming better at that language. Learners need to have a positive attitude towards the learning situation as well, which, in the case of video games, might not be directly applicable for all learners as some learners may not care about increasing their language proficiency whilst playing video games. Additionally, they might simply enjoy playing online games or MMOs, and not relate it to language learning whatsoever. In other words, simply playing and communicating online does not mean that the learner also enjoys language learning. Finally, the learner needs to be motivated in order for actual learning to occur. In the context of online gaming, this does not seem to be a problem, since, as discussed before, (online) gaming is an activity done as a pastime, for fun, and is thus based on intrinsic motivation. As such, as long as pupils also view the language learning aspect as a positive thing, assuming that language learning occurs through playing (online) video games does not seem too far-fetched.

In other research, Dörnyei and Ottó (1998) describe the concept of motivation in three stages: the preactional phase, the actional phase, and the postactional phase. The first phase

involves activities done before the actual task is approached, such as goal setting. As mentioned before, self-efficacy ties in with goal setting, in the sense that people with a higher sense of self-efficacy are more inclined to choose more ambitious goals and view these goals as challenges, rather than problems to be overcome (Bandura, 1994). The actional phase describes the moment the task is tackled. Choices have been made, the pupil is committed and it is now up to them to start working on the task and to keep working on the task and not be distracted by other influences, through what Dörnyei and Ottó (1998) call “action control” (p. 50). Finally, the postactional phase is perhaps the most relevant for the context of playing video games, and, to an extent, in relation to self-efficacy as well. This phase commences after task completion, and revolves around evaluation. The degree of success is determined by examining initial expectations set during the preactional phase and determining whether the intended goals have been reached (Dörnyei & Ottó, 1998). Based on this evaluation, the pupil may identify himself as a successful learner (Boekaerts, 1988, cited in Dörnyei & Ottó, 1998). This aspect clearly appears in video games as well, which are designed to challenge players to accomplish certain tasks, from solving a particular puzzle, to winning a game of football in the game *FIFA*, to tackling difficult content in cooperation with other players. Each of these challenges can be overcome, and may lead to feelings of success. This further enhances the sense of self-efficacy, and in turn motivation.

Furthermore, self-efficacy may affect motivation through Deci and Ryan’s (2002) self-determination theory. This theory describes three components that strongly affect student motivation: competence, autonomy and relatedness. Self-efficacy, or the belief about one’s ability to complete a certain task, can be closely related to the idea of competence, which Deci and Ryan (2002) define as the student’s belief that they can perform well. Measuring competence is done by measuring self-efficacy. In other words, self-efficacy can also be described as a component of motivation theory, rooted mainly in competence.

Self-efficacy and Performance

Though there are no studies examining the mediating effect of self-efficacy on the relationship between playing video games and EFL proficiency, research into the relationship between self-efficacy and performance is plentiful (Bandura; 1994; Schunk, 2004; Schunk & Pajares, 2009; Woolfolk, Hughes, & Walkup, 2013).

Several studies have shown positive relationships between self-efficacy, motivation and performance (e.g. Bandura, 1994; Bandura & Locke, 2003; Zimmerman, Bandura, & Martinez-Pons, 1992). On the other hand, several studies have also attempted to show no effects and even negative effects of higher sense of self-efficacy on academic performance (e.g. Vancouver, Thompson, Tischner, & Putka, 2002; Vancouver, Thompson, & Williams (2001), which were based on Powers's perceptual control theory (as cited in Bandura & Locke, 2003). This theory argues that people are not in control of their own behaviour nor the environment, but that perception of these two influences behaviour (Powers, 1991). However, on revisiting these studies by means of meta-analysis, Bandura (2012) and Bandura and Locke (2003) were unable to confirm those findings, and maintain their position on the positive effects of self-efficacy.

The following paragraphs explain through which processes self-efficacy affects motivation and performance. Bandura (1994) describes that "a strong sense of efficacy enhances human accomplishment" (p. 1), and notes that people with a high sense of efficacy see difficult tasks as challenges, rather than problems. Bandura lists the four types of processes that are suggested to have a mediating relationship between self-efficacy and human performance. Firstly, cognitive processes are enhanced. Bandura describes that people with a higher sense of efficacy will set higher goals and will be more determined to reach these goals. In gaming, this can be found in games that offer difficulty settings: options to choose between easy, normal, or difficult gameplay. Other games may be notorious for its

difficulty, for instance the *Dark Souls* series. It could be expected that pupils with a low sense of self-efficacy may pick games that are known to be easier, have open-ended goals without pressure (*The Sims*), or will choose lower difficulty settings.

Secondly, people with a higher sense of efficacy will sooner blame themselves for a lack of effort when a goal is not met, whereas people with a lower sense of efficacy will blame lack of ability. This could, in turn, result in failure avoidant behaviour: putting in no effort because a poor result is expected anyway. However, it must be said that some people might still blame their lack of effort, and use this as an excuse for not trying. This is behaviour that might, for instance, be the result of performance anxiety (Heimerdinger & Hinsz, 2008). In addition, because English is a subject that consists of multiple skill sets (e.g. communicating, reading, vocabulary knowledge) it could be the case that some pupils deliberately compensate for lack of skill in reading by rote learning for vocabulary tests, or vice versa: they may score poorly on vocabulary tests due to lack of practice, because they may score very well for reading tests. In this way, self-efficacy (related to reading) may negatively impact motivation on other types of tests.

Thirdly, Bandura (1994) mentions affective processes. Perceived self-efficacy will strongly affect the emotions of a person in relation to a task: they might experience stress, or depression for example, further affecting their overall motivation and potentially facilitating avoidance behaviour.

Finally, self-efficacy affects selection processes: people with a higher sense of efficacy will choose tasks that they deem a healthy challenge, whereas people with a lower sense of efficacy might choose tasks that are simple, strongly influencing the competencies they develop. In short, there are many ways in which self-efficacy can influence motivation and, potentially, performance. For these reasons, it can be expected that pupils who have a higher sense of self-efficacy will obtain higher grades. However, it should be noted that measuring

self-efficacy is still a topic of discussion, firstly because self-report may be unreliable, and secondly because self-efficacy is task-specific (Pajares, 1996). As such, although Bandura's (1994) model may be accurate, readers should be reminded that, when pupils' sense of self-efficacy may be higher when related to ESL learning, they may score much lower on these self-reports when asked about mathematical problems. As such, this study will be as specific as possible when examining self-efficacy by posing questions related to matters taught during English lessons specifically.

The relationship between self-efficacy and performance will be further explored in the current study. For instance, Zimmerman (1997) has shown that self-efficacy influences students' learning "both directly and indirectly by highlighting their persistence" (Rahimpour & Nariman-Jahan, 2010). The direct effect is described as self-efficacy influencing the learning process through cognitive and motivational means. The indirect effect describes this relation through persistence: students with a higher sense of efficacy will be more persistent in their approach to a certain task, which in turn increases their motivation.

Furthermore, Naseri and Zaferanieh (2012) have shown that a higher sense of self-efficacy leads to higher scores in reading comprehension, as well as self-efficacy beliefs and use of reading strategies. One suggestion may thus be that students with a higher sense of self-efficacy may be more aware of their reading behaviour and as such perform better, making their perspectives on their own reading abilities legitimate. In other words, similarly to the research done by Zimmerman (1997), students may either simply be 'better at reading' or their scores may be influenced by their persistence, and thus by their willingness to apply reading strategies.

By mapping the relationship of playing video games and the proficiency of English of L2 learners, this study will hopefully also be able to provide advice in regard to using games in class, or for teachers to be able to provide advice in regard to the gaming behaviour of

pupils in regard to performance in the classroom. Additionally, it may give teachers insight in self-reported self-efficacy remarks by students and help them evaluate the validity of these comments.

Research Questions

Based on the theoretical discussions above, this study will address the following research questions:

- 1. What is the relationship between playing video games during leisure time and the school performance of EFL students?*
- 2. Are there differential relationships between the type of video game played and the performance regarding different language skills?*
- 3. Is the relationship between playing video games and EFL school performance, if any, mediated by self-efficacy?*

Regarding the first question, several suggestions have already been made by the theoretical discussion. Based on those studies (e.g. deHaan, 2005a, 2005b; Gee, 2003, 2007) the expectation exists that increased time spent playing video games in English will increase EFL performance at school. This effect may occur due to the nature of the video game, such as the challenges they offer (Gee, 2003) or it may simply be the case that increased exposure may result in higher proficiency. In the latter case, however, the type of medium of exposure may not make a difference. In short, based on the previously discussed studies, it is to be expected that students who report playing video games will have higher grades than those who report spending no time playing video games.

It becomes more interesting when the behaviours of the uses of various media are concerned. Though watching series in English is, of course, exposure, some types of video

games are centred around communicating. As such, a higher number of hours spent playing online video games may result in better communicative skills as compared to those hours spent watching series, which may lead to increased reading and/or listening skills, but not so much productive skills.

Additionally, Ryu (2013) describes several steps the player experiences whilst playing games that are related to language learning. First, they learn words or phrases simply by playing the game by means of input from the game. Secondly, and this is where the offline and online gamers might differ from each other: the player practices his/her language skills by means of communication. Although this communication could occur between close groups of friends (e.g. all non-native speakers from the same country), they might also participate in cross-border communication with other non-native speakers of English (English as a *lingua franca*), or with native speakers. Finally, Ryu notes that these practices and interactions strongly influenced language learning, and showed common grounds with more traditional learning practices such as repeated practices and collaborative interactions. As such, regarding the second research question, it could be expected that learners who participate in (online) gaming will have better communicative skills compared to their non-gaming peers, due to online collaboration, or that (online) gamers' language skills may be better in general than that of their non-gaming peers.

Finally, the phrase "you are so good at English because you've played games all your life" is not uncommon. Students who hear this 'rumour' may start to believe in it, increasing their self-efficacy to some extent. Others may simply draw this conclusion by themselves. Admittedly, the role of self-efficacy in relation to the previously reported effects of playing video games on EFL proficiency has not been studied yet. However, some theories in second language learning may be related to this speculation.

Firstly, it might prove interesting to explore various reasons for playing video games. It could be for entertainment purposes, for instance to immerse oneself in a good story and thus, possibly, the language in which the story is presented (often provided by higher quality singleplayer games), for adrenaline or competitive purposes, and the desire to do well (more in line with multiplayer games but also singleplayer games, for instance on higher difficulties), or for social interaction and group activities (such as in MMOs).

Competitive purposes and the desire to do well affect motivation (Dörnyei, 1994). At the language learner level, students experience the need for achievement, but also anxiety. They have an idea of their own competence, described as the perceived L2 competence, as well as their ability to tackle a specific task, described as self-efficacy (Dörnyei, 1994). Students who are drawn to these types of games may have a more competitive personality in general, and may also exhibit similar behaviour, and may be driven by the same motivational systems when they are working on academic tasks as when they are playing video games. They may be motivated by wanting to score a higher grade than their friend, or to generally score as high as possible, simply for ‘bragging rights’, which is also something that emerges in video gaming.

Playing MMOs is often based on the desire to interact with many people simultaneously. As discussed before, this may be related to the idea of integrative motivation (Gardner, 2001), or the desire to be proficient in a language so that interaction, or even identification, with speakers of the second language will be possible (Noels, 2001). Interestingly, Noels finds that in the light of Deci and Ryan’s self-determination theory (competence, autonomy, relatedness) (2002), it is encouraged to implement an integrative orientation to second language teaching, which in turn would lead to genuine interest in the target language community. In regard to MMOs, however, it is not only about interacting with Anglophones, but with people from various countries. More often than not, MMOs divide

their servers into continents, resulting in people from America playing together, and people from European countries playing together, but the default language is generally English. As such, engaging with this community might not only offer good practice in language performance, but also show an interest in wanting to interact with people from various cultures. In other words, students that play these types of games a lot may have a higher degree of motivation to communicate and to learn the second language, which in turn may result in higher grades for L2 school tests.

This potential evidence is all indirect by nature, however, and there has been no prior study into the relationship between self-efficacy (and motivation) and playing video games. As such, a null hypothesis will be adopted.

Method

Participants

For this study, six teachers across two secondary schools in the Netherlands were approached. Unfortunately, two teachers did not respond to multiple attempts to initiate contact and, as such, the participant pool consisted of 154 4havo pupils. Their mean age was 15 years and 2 months. The pool consists of 73 female students and 81 male. The main school approached is located in a reasonably well-off area in the Netherlands, and has students of various ethnicities, but mostly being Dutch. There were some students who were bilingual (Moroccan/Dutch, Polish/Dutch), but most of the students reported speaking only Dutch at home (N=122). The second school approached is in a mixed area with slightly less well-off families from many different ethnicities, mainly Arabic, Moroccan and Turkish. However, from this school, only four students filled in the questionnaire, two out of which were ultimately usable for this study, due to incomplete data provided either by the students on the questionnaire, or the teachers. Out of these 154 pupils, several pupils did not finish the questionnaire or answered with words (“sometimes”) rather than estimates in hours per day,

rendering their responses unusable. The final participant pool consisted of 146 4th grade pupils and included both gamers (N = 70) and non-gamers (N = 76). All of these data were found to be suitable for analysis. Pupils classified as gamers are pupils who indicated spending any time playing video games.

Materials

Questionnaire. As mentioned before, this study included a questionnaire asking about pupils' demographic information (name, group, teacher name) as well as out-of-school media-related behaviour. The students' group and the teacher's name also needed to be included in order to eliminate as many outside influences as possible, such as teacher influences. The goal of this questionnaire was to determine which students had overall higher exposure from various media, and which students were very strongly exposed to the English language in video games specifically. In order to obtain more detailed information, the questionnaire also made a distinction between gaming online and offline, and if online, also between online games with 'chatboxes' (reading and writing) and 'voice chat' options (speaking and listening). Finally, use of third party software was initially intended to be included. However, it was determined that a general inquiry into the amount of time spent communicating by voice would suffice. This questionnaire contained questions about daily behaviour, as opposed to weekly behaviour, because the former may be easier for pupils to calculate. This questionnaire can be found in Appendix A.

School performance. Besides this questionnaire, school grade scores were gathered by approaching teachers of English in the respective classrooms. Although the scores were not anonymised during the gathering phase, teachers and pupils were told that the data would be anonymised during the analysis of the data, and any personal information would not find its way into the final product of this study and its appendices. The school grades used for this

study included three CITO⁵ reading scores (periods 1, 2 and 3), two CITO listening test scores (periods 1 and 3), three vocabulary scores (periods 1, 2 and 3) and one writing grade based on a creative assignment for which students had to write a magazine (period 2). These scores were subsequently used to calculate a mean English grade, as well as mean grades for each skill. Unfortunately, no classes had been tested on speaking skills in a consistent manner. Three of the six classes had it tested via the creation of a vlog, and the other classes had presentations planned, but not graded. These grades were all from the current year, since this allowed for their most recent grades to be related to their current gaming behaviour and self-efficacy.

Self-efficacy. Additionally, pupils reported on their self-efficacy by means of another questionnaire, which can be found in Appendix B. This list of questions was based on a list used by Pintrich and De Groot (1990), who focused on motivation, (meta)cognitive strategy use and management of effort, which they have named the ‘Motivated Strategies for Learning Questionnaire’ (MSLQ). This questionnaire was initially aimed at English classes, albeit in a native speaker environment. However, they have posed the questions in such a way that they were general enough for easy adaptation to the EFL classroom, and have been suggested to be generally reliable (Duncan & McKeachie, 2005; Hilpert, Stempfen, Van der Hoeven Kraft, & Husman, 2013; Pintrich & De Groot, 1990; Pintrich, Smith, Garcia, & McKeachie, 1993). Questions related to self-efficacy were extracted from the initial realisation of the MSLQ and used for this study in order to measure students’ self-efficacy. Additionally, questions regarding motivation were also added as filler questions. Items 1, 2, 5, 6, 7, 8, 10, 11, 12, 14, 16, and 17 were all related to self-efficacy (where 16 and 17 also carried a nervousness

⁵ Dutch: Centraal Instituut voor Toetsontwikkeling. A centralised institute which develops and distributes tests and final exams, mostly used by schools on a national scale.

component) and were analysed as one group of questions predicting self-efficacy scores. The remaining questions 3, 4, 9, 13, and 15 were related to motivation and served mainly as filler items. Finally, in order to make analysis more feasible, some reverse code items were reversed (similar to Duncan & McKeachie, 2005), so that they were all formulated positively: giving a higher score to a certain question indicated a higher degree of self-efficacy. The questionnaires were combined into one, and subsequently created and distributed using the platform [thesistoolspro.com](https://www.thesistoolspro.com).

Procedure and Analyses

The teachers were contacted by e-mail and asked whether they would like to cooperate. Subsequently, participants were approached and asked to fill in a questionnaire during the computer lessons, which allowed for more easy navigation of the website in question. This would also fit in better with the lesson plans at the schools. Pupils and teachers were told that results would be anonymised at a later stage during the analysis of the data, since school grades and responses to the questionnaire needed to be compared. Besides basic information such as names, teacher names, and classes, pupils also had to fill in their behaviour with regard to gaming and other exposure to extramural exposure to media in order to measure their exposure to these media. Finally, participants filled in the self-efficacy part of the questionnaire. For feasibility, students filled in both questionnaires at the same time, as one larger combined questionnaire.

Besides the questionnaires, students' school grades were also collected with their permission. Teachers were asked for the lists of grades, and were sent a final reminder on the last day of the week of data collection. Most teachers responded the same day, one responded after the weekend.

Afterwards, data were analysed and compared and underwent statistical analysis. First, school grades were added to the overview of the responses to the questionnaire. Mean scores

were calculated for each skill tested (reading, writing, listening, vocabulary) and added as four new columns. Subsequently, mean self-efficacy scores were calculated based on the relevant items from the MSLQ. Correlations were calculated between number of hours each day spent playing video games and mean English grades, between the various types of games (singleplayer, multiplayer, MMO) and mean scores for the various skills, and between manners of communication (written, spoken) and the mean English grades and mean scores for the various skills. Additionally, correlations were calculated between hours per day spent gaming and self-efficacy, and between self-efficacy and mean English grade. Finally, a causal mediation analysis was used to determine whether the relationship between hours per day spent gaming and mean English grade was mediated by self-efficacy. Finally, t-tests were used in order to compare the group of gamers to the group of non-gamers in terms of mean English grades, and mean grades for each language skill individually.

Results

The mean number of hours per day playing video games across all participants is 1.2 hours (SD = 2.20). On average, students scored their self-efficacy at 6.01 (SD = 1.79). Finally, mean English grades across all participants is 6.74 (SD = 0.81) on a scale from 1 to 10. Table 1 shows an overview of the relevant descriptive statistics.

Table 1

Means and SDs for all Relevant Variables Across the Participant Pool (N=146)

<u>Activity</u>	<u>Mean</u>	<u>SD</u>
Time spent gaming (in hours per day)	1.21	2.20
Time spent playing singleplayer games	0.47	1.49
Time spent playing multiplayer games	0.91	1.81
Time spent playing MMOs	0.21	0.75
Time spent communicating (written)	0.52	1.11
Time spent communicating (spoken)	0.36	0.94
Mean English grades	6.74	0.81
Reading grades	6.04	1.18
Listening grades	6.31	1.27
Writing grades	7.51	1.31
Vocabulary grades	7.11	1.50
Self-efficacy scores	6.02	1.79

In regard to the first research question, simply playing video games in English does not seem to have a direct relationship with school performance in the current study ($r = .067$, $p = .421$), which means that previously attested influences could not be reproduced. However, when comparing the group of gamers and the group of non-gamers, subsequent t-tests showed that students who reported playing video games to some extent ($N=70$) significantly outperformed students who reported never playing video games ($N=76$) at mean English grades ($t(143.27) = 3.08$, $p = .002$), at reading tests ($t(142.87) = 2.49$, $p = .014$) and at listening tests ($t(142.7) = 4.70$, $p = .000$). Furthermore, Table 2 shows all correlations measured in relation to mean English grade, including playing various types of games and number of hours spent each day communicating online.

Table 2

Correlations between Videogame Activities and Mean English Grade

<u>Activity</u>		<u>Mean English grade</u>
Playing video games	Pearson Correlation	.067
	Sig. (2-tailed)	.421
Playing singleplayer video games	Pearson Correlation	.109
	Sig. (2-tailed)	.189
Playing multiplayer video games	Pearson Correlation	.027
	Sig. (2-tailed)	.746
Playing MMO video games	Pearson Correlation	.059
	Sig. (2-tailed)	.476
Written communication	Pearson Correlation	.211*
	Sig. (2-tailed)	.010
Spoken communication	Pearson Correlation	.076
	Sig. (2-tailed)	.363

Notes. * Correlation is significant at $p < 0.05$
** Correlation is significant at $p < 0.01$

One significant correlation was found in relation to mean English grade: communicating via written chat shows a positive correlation with mean English grades ($r = .211$, $p = .010$). Playing singleplayer games has a weak positive correlation with mean English grade that was found to be nonsignificant ($r = .109$, $p = .189$), the correlation between multiplayer games and mean English grade is weak and nonsignificant ($r = .027$, $p = .746$) and the correlation between MMOs and mean English grade is also weak and nonsignificant ($r = .059$, $p = .476$).

In regard to the second research question, the various types of games were linked to the different skills of English language learning. The results show several significant findings

which are represented in Table 3, along with all other correlations between various types of games and activities and mean grades per skill.

Table 3

Correlations between Videogame Activities and Various Language Skills

<u>Activity</u>		<u>Mean</u>	<u>Mean</u>	<u>Mean</u>	<u>Mean</u>
		<u>Reading</u>	<u>Listening</u>	<u>Writing</u>	<u>Vocab</u>
		<u>grade</u>	<u>grade</u>	<u>grade</u>	<u>grade</u>
Playing singleplayer video games	Pearson	.110	.174*	-.001	.005
	Correlation Sig. (2-tailed)	.186	.035	.994	.951
Playing multiplayer video games	Pearson	.063	.197*	-.058	-.104
	Correlation Sig. (2-tailed)	.450	.017	.487	.213
Playing MMO video games	Pearson	.157	.241**	-.035	-.162
	Correlation Sig. (2-tailed)	.059	.003	.673	.050
Written communication	Pearson	.276**	.333**	.044	-.070
	Correlation Sig. (2-tailed)	.001	.000	.603	.404
Spoken communication	Pearson	.167*	.223**	-.028	-.125
	Correlation Sig. (2-tailed)	.045	.007	.739	.134

Notes. * Correlation is significant at $p < 0.05$
 ** Correlation is significant at $p < 0.01$

Firstly, all types of games played have shown a moderate positive correlation with the mean grades for the listening tests. Time spent playing singleplayer (offline) games showed a weak positive correlation with the listening grades ($r = .174$, $p = .035$), as well as time spent

playing multiplayer games with listening grades ($r = .197, p = .017$) and time spent playing MMOs with listening grades ($r = .241, p = .003$).

Furthermore, there is a significant correlation between communicating online and reading grades for both written communication ($r = .276, p = .001$) and voice communication ($r = .167, p = .045$). This could be explained due to the nature of MMOs and their requirement of having to communicate with fellow players. Both of these manners of communication also significantly correlate positively with the listening grades ($r = .333, p = 0.000$ and $r = .223, p = .007$ respectively). Further correlations that were found in regard to game types and separate language skills were found to be not significant.

Regarding the third research question, correlations were measured between time spent playing video games, mean self-efficacy scores, and mean English grades. When examining a potential mediating effect of self-efficacy on the relationship between the amount of gaming and school performance, the correlation between the amount of gaming and self-efficacy was found to be significant ($r = .185, p = .024$) as well as the correlation between self-efficacy and mean grade ($r = .582, p = .000$). Significant positive correlations were also found between written communication and self-efficacy ($r = .294, p = .000$) and spoken communication and self-efficacy ($r = .244, p = .003$). Finally, a causal mediation analysis showed a significant mediation effect of self-efficacy on the relationship between amount of gaming and mean English grade (ACME = .04, $p = .02$) with no direct effect of the amount of gaming (ADE = -0.005, $p = .85$).

Discussion

The aim of this study was to examine whether a relationship exists between time spent playing video games and school performance and whether pupils who play video games outperformed their non-gaming peers. Secondly, this study made an attempt at examining whether various types of video games affected different language skills, and included two

ways of communicating through gaming as well: via written chat and via voice chat. Finally, this study examined whether the relationship between (time spent) playing video games was mediated by self-efficacy.

In regard to the first research questions, as noted in the results, the previous relationships shown between gaming and language proficiency (Chen & Yang, 2013; Gee, 2003) could not be reproduced directly. In other words, simply spending more time playing video games was not shown to increase English grades. As such, at this point, the hypothesis remains unconfirmed. This may have several causes. Firstly, it may be the case that the extent of differences in time spent playing video games did indeed not matter for the English grades. However, interestingly, the subsequent t-tests showed that a difference does exist, namely between gamers and non-gamers. Gamers outperformed non-gamers in three areas: mean English grades, listening tests, and reading tests. Due to the fact that the reading and listening tests were all CITO tests, which all weigh heavier in the calculation of the final mean English grade, it makes sense that these tests influence the mean English grade the most. In other words, it is entirely possible that pupils who score higher on these CITO tests will also have a higher mean English grade.

In addition, the listening and reading tests are tests that determine the learner's receptive skills. It could be the case that gamers are much more immersed with the language outside of school than non-gamers, and spend a lot of time reading and listening to the English language. This is in line with findings from Ryu (2013), who emphasised the benefits of video games that expose learners to a large amount of audiovisual input. For instance, a videogame may feature written dialogues, which need to be read by the player for them to understand the story, or it may be voice-acted which requires the player to listen, and potentially read along when dialogue boxes are present in addition to voice acting. In other

words, they may be practicing their receptive skills unknowingly whilst doing an activity they genuinely enjoy.

Unfortunately, writing was tested via a creative assignment (creating a magazine) during this study, and, based on conversations with the teachers involved, it was found that many points were awarded simply due to creative design, effective layout and interesting items, leaving no impactful influence of writing proficiency itself on the final grade. Furthermore, speaking had not been tested at the time of the study. As a result, only the receptive skills, as well as vocabulary, can be taken into serious consideration regarding these comparisons. A logical step, then, is to examine the effect of gaming on vocabulary. The study has found no such effects. A reasonable assumption then seems that immersive settings through videogaming may positively affect receptive skills (reading and listening), which is in line with the findings mentioned before by Gee (2003).

In addition, as mentioned before, Chen and Yang (2013) found positive effects of playing video games on vocabulary learning, but these findings could not be reproduced. This could be because the target items implemented by Chen and Yang (2013) all appeared in the games they had their participants play. Vocabulary testing in the current study was entirely unrelated to the vocabulary that the participants were exposed to, since these participants played video games in their leisure time, and played the games of their choice. In sum, it could be argued that while playing video games may increase vocabulary knowledge, it does not necessarily include the vocabulary measured through tests at school. However, games may be an interesting medium to increase vocabulary when used in specific ways, when the games chosen contain the vocabulary to be learned for a specific test, such as in Chen and Yang's (2013) study. To refer back to an example made before, when pupils are to learn more vocabulary related to ancient mythology, an instructor may assign homework in the form of playing the game *Age of Mythology*, which presents many stories from various mythologies

including Greek, Egyptian and Norse mythologies. This way, students may learn vocabulary items such as ‘Trojan Horse’, ‘plunder’, and ‘mastaba’ (old Egyptian tombs).

The aim of the second research question was to examine potential relationships between playing various types of games and the different language skills. The relationship of singleplayer gaming and multiplayer gaming with the listening grades is almost identical: they are both relatively weak positive significant correlations. These types of games, being lower on the SSI scale than MMOs, are as such unsurprisingly less strongly correlated with English grades. This may have several causes. For instance, it is not necessarily the case that people playing multiplayer games (excluding MMOs) are more engaged with the English language than people playing singleplayer games. For example, the multiplayer Battle Royale game called *Fortnite* is by far the most popular game at the current point in time, with about 250 million players in March 2019, over double that of the previous year (Gilbert, 2019). As described earlier, a Battle Royale game has a player drop into a world of a hundred players, who are all fighting one another: the last man standing is the winner. In this game, unless playing in teams, players do not communicate with one another. On the other hand, singleplayer games may offer much more interaction with the world itself, which may feature a lot of non-player characters (NPCs) who also have a story to tell. That said, concluding that MMOs offer more chances to encounter and actively use the language than singleplayer and multiplayer games may be credible, but stating multiplayer games feature more language exposure than singleplayer games, simply based on the presence of other players, seems too simple. For instance, smaller-scale team-based online games such as *Call of Duty*, or *Fortnite*'s team-based modes, are often played by players and their friends, who would most likely communicate in their first language, in this case Dutch. In addition, the amount of communication, both written and spoken, significantly correlate positively with mean listening grade as well. In other words, it may simply be the case that the pupils who tend to

play certain games, may also tend to communicate more online. It would be interesting to examine these groups in further detail, in order to examine whether it is the combination of playing more social games and communicating simultaneously, or whether the type of game played in isolation is also related to better listening grades.

Besides the relationships between gaming in general and listening grades, this study has also found positive correlations between the two forms of communication and reading grades. This finding may be particularly interesting for classroom settings, since reading is a crucial part of the final exam in English. A potential advice would be for schools to implement more communicative activities in the classroom. However, it may be a premature assumption to say that focus on communication would improve reading grades. For instance, it may simply be the case that pupils who are better at English in general, have a higher sense of confidence and are less anxious to engage in communication with people over the internet, whether by voice or written communication. This could warrant further research into the foundation of this relationship in order to potentially alter the way English is taught at some schools.

Finally, in regard to the third research question, the results suggest that the relationship between the amount of gaming and school performance is mediated by self-efficacy. Although a direct relationship between video games and school grades could not be found, an indirect relationship was found via self-efficacy. This indicates that although simply spending more time playing video games may not be related to English grades, it is suggested that playing more video games increases self-efficacy, which in turn has a positive effect on English grades. The next step of this field of research would be to examine the nature of this relationship. As mentioned before, it is entirely possible that higher grades lead to a higher sense of self-efficacy, but based on the theory discussed earlier (e.g. Bandura, 1994) this relationship goes both ways: increased self-efficacy positively affects English grades. Both of

these directions are strongly rooted in scientific literature (Deci & Ryan, 2002; Dörnyei, 1994; Woolfolk, Hughes, & Walkup, 2013 for motivation in general; Bandura, 1994 for efficacy specifically). A reasonable assumption is that one of the sources for this increased sense of self-efficacy lies in the experiences of success. Well-designed video games are focused around certain goals (Gee, 2003) and make these goals a healthy challenge to be achieved. When goals are created in such a way that anyone can overcome them (potentially at their own level via difficulty options) they are guaranteed to provide experiences of success, increasing self-efficacy and motivation. This is not unlike the language learning setting, where clear goals (around which curricula are built) being met increases student motivation and self-efficacy. Additionally, these experiences can also be applied to the idea of integrative motivation (Gardner, 2001), as positive experiences can be found in the communication with other people online. It is likely not a coincidence, then, that especially time spent playing MMOs, and communicating online (via written and spoken media) were shown to have the strongest relationships with specific skills, since both collaborative interactions are an effective way of learning, and successful communication in a foreign language may be felt as a positive experience.

Furthermore, the relationship between self-efficacy and the amount of gaming has not been defined, although it seems to exist based on the current study. The previously mentioned assumption of “you are good at English because you play so many games” may indicate that gamers at least feel that they are good at English, or at least should be, and as such may score more highly on self-efficacy questionnaires. It is also possible that students score themselves highly because they *want* to do well, for instance due to a competitive personality. Another possibility is that certain pupils like playing English video games more because they already have more affinity with the English language, thus scoring higher grades and having a higher degree of self-efficacy.

Finally, it should be noted that individual variation has played a large role in this study. This can be seen from the large standard deviations in regard to gaming behaviour. This can be explained based on several thoughts. Firstly, when examining the data in more detail, it becomes clear that approximately half of the participants reported not to play any video games at all. In other words, they reported to spend zero hours per day playing games. On the other hand, there were individuals that reported playing for a considerable number of hours each day. As mentioned before, a large portion of the population tends to play games for four hours or longer each day.

Conclusion

A direct relationship between the frequency of playing video games and EFL performance (operationalised as mean English grade) could not be found. However, it seems that such a relationship exists between and is mediated by pupils' self-efficacy: The amount of gaming is a significant predictor of self-efficacy, which in its turn predicts EFL performance. In addition, during group comparisons, it was found that students who reported playing video games scored significantly better mean English grades, and also performed better at reading and listening tests. Also, playing video games relates to higher scores for listening tests, and written as well as spoken communication are both related to higher listening and reading scores. Finally, there are significant correlations between gaming and self-efficacy, and self-efficacy and mean English grades.

Thus, it seems that the relationship between gaming and English performance at school is not a far-fetched one. This may have several implications for teachers, and how English is taught in the classroom. Playing video games may promote vocabulary learning, but only when the target vocabulary and the game being played are in tune with one another. However, pupils playing games scored higher on the receptive tests and had higher mean English grades. At the least, it could be argued that video games provide a valuable immersive

setting where language acquisition may occur, and thus may join other forms of media such as TV shows for being a suitable way of immersing oneself. Additionally, promoting self-efficacy in classrooms may also increase language performance at school, since the two have been shown to be closely related. For instance, when preparing for a difficult task, the teachers could have pupils measure their own self-efficacy by means of the questionnaire used in this study, and pupils may find that attempting to acquire the knowledge they feel they lack may positively affect their performance on the upcoming task. It also gives the teacher some guidelines how to differentiate or, in other words, how to approach each pupil's learning trajectory on an individual basis.

Additionally, the findings related to communicating online through a written medium also suggest that this might be an interesting way of improving English performance. Written communication could be encouraged, although such assignments exist in classrooms already in the form of writing letters. However, students could be encouraged to look for ways to communicate online with native or other non-native speakers of English from around the world.

In the end, it must be said that these findings cannot be generalised without a second thought. After all, gamers choose to perform this activity because they want to and are intrinsically motivated; it is their hobby. Simply stating that teachers should implement games in the classroom based on this study would be too hasty, since the motivational effects, and the role of self-efficacy, which was shown to be essential in this relationship, would be weakened if pupils were told to play games, especially if they do not like playing video games in the first place. However, it is a good way of nurturing the intrinsic motivation, and could 'keep English fun' for those who enjoy video games.

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Appendix A: Questionnaire Out-of-School Exposure

Beantwoord de onderstaande vragen.

1. Naam: _____

2. Geboortedatum: _____

3. Klas: _____

4. Docent Engels: _____

5a. Welke taal (of talen) spreek je buiten school (thuis, buren, vrienden, collega's, familie)?

5b. Als je hierboven een taal naast Nederlands hebt ingevuld, geef dan hier aan hoeveel uren per week.

6. Wanneer kreeg je voor het eerst lessen Engels (bijvoorbeeld, in groep 3 of in groep 6)?

7. De volgende vraag gaat over het gebruik van media buiten school, waarbij je wordt blootgesteld aan de Engelse taal. Vul in hoeveel uur **per dag** je gemiddeld besteedt aan deze activiteiten. Besteed je aan een bepaalde activiteit helemaal géén tijd, vul dan 0 in.

Activiteit:	Aantal uur per dag:
Lezen van Engelse boeken en/of strips op papier.	
Lezen van Engelse blogs en/of artikelen online.	
Luisteren naar Engelstalige muziek/podcasts/audioboeken	
Kijken naar Engelstalige filmpjes op YouTube	

Kijken naar Engelstalige livestreams op YouTube, Twitch, of anders	
Kijken naar Engelstalige series/films op TV/Netflix/anders	
Spelen van Engelstalige games	
Spreeken van Engels met andere mensen (o.a. Skype, Discord)	

8. Wanneer je video games speelt, op welke moeilijkheidsgraad speel je dan het liefst? Geef op de schaal hieronder een oordeel van 1 tot 10, waarop 1 gelijkstaat aan *very easy*, en 10 gelijkstaat aan de hoogste moeilijkheid (*very hard, extreme, hardcore, etc.*).

1	2	3	4	5	6	7	8	9	10
Very easy									Very hard

9. De volgende vraag richt zich vooral tot je gedrag wat betreft het spelen van Engelstalige video games. Vul in hoeveel **uur per dag** je gemiddeld besteedt aan de volgende activiteiten.

Activiteit:	Aantal uur per dag:
Het spelen van games <u>offline</u> (singleplayer) (bijv. <i>The Witcher 3, Skyrim, Tomb Raider, etc.</i>)	
Het spelen van games <u>online</u> (multiplayer) (bijv. <i>Fortnite, Apex Legends, World of Warcraft, GTA online, etc.</i>)	
Het communiceren, in het Engels, met anderen middels <u>geschreven</u> chat (bijv. chatboxes zoals in <i>World of Warcraft</i> , typen op Discord)	

<p>Het communiceren, in het Engels, met anderen middels <u>voice</u> chat/<u>gesproken</u> chat (bijv. spreken op Discord of in-game voice chat)</p>	
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Appendix B: Self-efficacy Questionnaire

Geef aan in hoeverre jij het met de volgende stellingen eens of oneens bent. Je kunt een score geven van 1 tot 10, waarbij 1 'zeer oneens' betekent en 10 'zeer eens'. Zie hieronder een voorbeeld.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

1. Vergeleken met andere leerlingen in deze groep, verwacht ik goed te presteren voor het vak Engels.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

2. Ik weet dat ik de lesstof van de lessen Engels goed kan begrijpen.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

3. Ik vind het leuk om Engelse les te krijgen.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

4. Ik vind het belangrijk om Engelse les te krijgen.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

5. Vergeleken met anderen in mijn klas, vind ik dat ik een goede leerling ben wat betreft de Engelse les.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

6. Tijdens toetsen Engels ben ik nooit zo nerveus dat ik belangrijke dingen vergeet.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

7. Ik weet zeker dat ik de taken in de lessen Engels zeer goed kan uitvoeren.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

8. Ik verwacht dat ik hoge cijfers haal voor de Engelse leestoetsen.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

9. Wanneer ik een onderwerp moet kiezen voor een project voor Engels (bijv. voor een presentatie of verslag) kies ik er het liefst een uit waarvan ik nog niet zoveel weet.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

10. Mijn leerstrategieën (hoe je leert) voor Engels zijn excellent vergeleken met die van andere leerlingen.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

11. Vergeleken met andere leerlingen, denk ik dat ik goed ben in Engels.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

12. Ik denk dat ik gemakkelijk een gesprek kan voeren met een moedertaalspreker Engels.

1	2	3	4	5	6	7	8	9	10
Zeer									Zeer
oneens									eens

