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Video Games in Language Teaching: Hungarian English Teachers' Cognition, Attitudes, and Practices

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Abstract

Despite the fact that video games have been a part of our everyday lives for decades and have provided opportunities for out-of-school language learning through their abundance of authentic input, English language teachers have been slow to adopt and incorporate them into their practice (Blume, 2019). The present study aimed to explore the background of this reluctance by focusing on elements of gaming-related teacher cognition: teachers' experiences, attitudes, and beliefs about video games and perceptions about gamer-learners. An online questionnaire-based study was designed to collect data from Hungarian English teachers ($N = 100$) with a variety of scales eliciting information on teacher cognition. The results imply a general deficit in language teachers' understanding of and contact with video games; however, the participant teachers appeared to show openness towards video games and perceived them as a useful means of language learning, which was reflected in their significantly higher rating of gamer-learners' proficiency and self-confidence ($p < .05$). In addition, a pathway analysis of regression models showed that it was teachers' contact with games rather than their age that most strongly influenced their attitudes and perceptions of video games. Implications for teacher training and professional development are also discussed.

Keywords: video games, teacher cognition, beliefs, ELT

Video Games in Language Teaching: Hungarian English Teachers' Cognition, Attitudes, and Practices

Video games have been a part of popular culture since the arrival of the arcade table tennis game *Pong* in 1972. Since then, the video game industry has surpassed films and music in its overall revenue (Chatfield, 2009). Movies have been adapted into video games, and video games have found their way into movie theatres as well; since 2004, the British Academy of Film and Television Arts (BAFTA) has been honoring outstanding video games annually in the British Academy Games Awards. For about two generations of people, video games have already become as integral to everyday life as films or music.

Crucially, the overwhelming majority of these computer games are developed in English and are played in English throughout the world, providing hundreds of millions of players with the opportunity to engage in a highly immersive and interactive activity that is mediated through English, which should theoretically serve as an excellent source of input for language learning.

Although English language video games have been an integral part of our lives for decades, research interest into the affordances of video games for language learning has only gained momentum in the last decade with first of a kind studies by Sundqvist and Sylvén (2012, 2014, 2016; Sylvén & Sundqvist, 2012), who showed gaming to be an out-of-school activity highly conducive to language learning. Henry (2013, 2014) directed attention to gamers' senses of self-authenticity and self-efficacy and possible negative relations to learning motivation, while Chik (2012, 2013, 2014) investigated autonomy and beyond-game English language use and teachers' beliefs about the possible language learning opportunities in video games. A further important watershed was Reinders' (2012) edited volume on the topic of digital game-based language learning.

Despite the growing interest in video games, a majority of the studies focused on language proficiency (mostly vocabulary) gains in largely uncontrolled quasi-experimental designs, or have formed conclusions regarding the influence video games might have on a number of individual difference variables which

might lead to positive or potentially negative outcomes for language learning. Only a few studies (e.g., Reinders & Wattana, 2012; Sundqvist & Wikström, 2015) have focused solely on gamers and their language learning.

Still, as the amount of evidence lending support to the highly useful nature of gaming is growing, commercial off-the-shelf (COTS) video games have yet to enter the language classroom (Blume, 2019). Teachers' reluctance to tap into the opportunities of video games may be explained by a lack of resources and time, but also by a general lack of experience with video games, a deficient understanding of what gaming entails and how language learning may benefit from it, and arguably a number of stereotypes surrounding video games (eNet, 2019). However, as Blume (2019) noted, it is imperative that teachers' beliefs about video games and game-based language learning are understood and possibly formed to accommodate new techniques, knowledge, and a range of new motivational strategies in a world where English is increasingly more easily accessible outside the school context (Henry, Korp, Sundqvist, & Thorsen, 2017).

In order to develop a better understanding of teachers' perceived reluctance to incorporate elements of video games in the practice of English language teaching, the present study aimed to uncover Hungarian English language teachers' gaming-related beliefs, attitudes and knowledge, and relevant background variables.

Review of Literature

As mentioned above, video games may arguably be called one of the prime examples of a relatively new out-of-school activity affording considerable amounts of extramural ("outside the wall of the school") contact with English (Sundqvist, 2009, p. 1). They have been shown to facilitate vocabulary learning (Sundqvist, 2019; Sundqvist & Sylvén, 2012), oral proficiency (Sundqvist, 2011), and also to boost learners' willingness to communicate in English (Reinders & Wattana, 2012).

It is argued here that there are several unique affordances intrinsic to video games that make them an object of interest in the field of language teaching. Most video games - especially online multiplayer games - offer a low-stakes

opportunity for using the language for task- and goal-oriented communication (Reinhardt & Thorne, 2016; Thomas, 2012) involving negotiation for meaning in online player-to-player interactions. Furthermore, video games provide ample amounts of meaningful and contextualized input for language learning. In the foreword to Reinders (2012), Gee offers a fitting summary to the affordances of digital games in relation to meaningful and contextualized language use:

The main thing games can do for language learning is to “situate meaning”. Games associate words with images, actions, goals and dialogue, not just with definitions or other words. Learners come to see how words attach to the world’s contexts or situations that they are about and help to create or manipulate. (Gee, 2012, p. xiv)

Recent role-playing games like *Fallout 4* offer an abundance of contextualized and meaningful content for learners that can serve as written and often simultaneously auditory input: the game developers claimed to have recorded 111,000 lines of script for the game that is delivered by voice actors (not including written lore) (Bethesda, 2015) which, at more than 1 million words, puts it on par with *The Bible* or the combined books of the *Harry Potter* series. This ample amount of input is argued to serve as an excellent setting for implicit language learning.

In research about language learning from video games, studies have successfully demonstrated a teacher-based approach which raised awareness of the language by creating tasks or word lists for gamers, an approach that was conducive to either intentional or incidental language learning using the input provided by video games (Miller & Hegelheimer, 2006; Ranalli, 2008). Surprisingly, this strand of research was largely discontinued in spite of the positive effects on vocabulary gains.

As such, an issue crucial to the potential of video games relates to the possibilities of their implementation in actual pedagogical practice, the understanding of which requires review of what teachers do in (and outside) the classroom and what intrapersonal system involving attitudes, beliefs, knowledge, and experience may influence their behavior.

Teacher Cognition

Language teachers' pedagogical knowledge, beliefs, and attitudes - or teacher cognition as per S. Borg's (2003, 2009) umbrella term - have been the topic of an extensive body of research since the 1990s (Kern, 1995; Pajares, 1992), and have been shown to be at the core of teachers' decision-making in terms of in-class pedagogical choices and planning processes as well (e.g., S. Borg, 2011; Fives & Buehl, 2012).

An important factor at play regarding teachers' beliefs, attitudes, and by extension pedagogical choices is often considered to be their own learning experience (S. Borg 2003, 2009; Moddie, 2016; Pajares, 1992) via apprenticeship of observation (Lortie, 1975), a notion describing the phenomenon whereby teacher trainees' teaching methods and conceptions of teaching are heavily influenced by the fact that they had spent thousands of hours in school as learners observing their teachers (M. Borg, 2004). A key consequence of this phenomenon is that observing teachers from previous generations renders pedagogy a rather conservative profession (Schempp, 1989) where concepts of what teaching is and what schools should be like are passed down to new generations of teachers, cyclically reinforcing sometimes erroneous practices and beliefs (Smagorinsky & Barnes, 2014). It must also be noted that in many cases teachers' negative experiences as learners can lead to an inverse effect, a so-called anti-apprenticeship of observation (Moddie, 2016), where teachers strive to avoid copying their own teachers' techniques. As such, the ways current in-service English teachers learned the language might hold key insights into their beliefs, and thus their pedagogical practice.

Factors Influencing Teachers' Adoption of New Technologies

Concerning digital technology, Sprague (2004) controversially stated that teachers have constantly been on the back foot when new digital technologies emerge and are often in a decade's worth of delay behind the currently used technologies. This has also been seen as an ominous sign in an era in which digital literacy can become a currency for teachers among learners (Becker, 2007).

In the last decades, studies have shown teacher's beliefs, attitudes, and

underlying first-hand experience to be significant factors in their willingness to adopt digital technologies. Numerous recent studies have linked teachers' knowledge and beliefs (influenced by experience and knowledge) regarding new digital technologies (Albirini, 2006; Becker, 2007; Blume, 2019; Tondeur, Scherer, Siddiq, & Baran, 2017) to their application, or lack thereof, in language learning classrooms.

A widespread model of understanding teacher's attitudes towards implementing new technologies (e.g., ICT devices) in their practice is the Technology Acceptance Model (TAM) of Davis (1989), which, rooted in social cognitive theory (Bandura, 1977), states that perceived ease of use and perceived usefulness are the two main predictors of acceptance, both of which are significantly impacted by knowledge of and experience with the technology (Blume, 2019; Hsu, 2016). Another important conceptualization of the factors influencing teachers' decisions to accept innovation showed that teachers' willingness to try new technologies depended on the perceived advantages of the technology, its compatibility with teaching practices, a relative lack of complexity, and the presumption of observable results (Rogers, 1995).

It has also been argued (Fullan & Stiegelbauer, 1991) that when faced with a choice, teachers apply a practicality ethic to their decisions (i.e., focusing on achieving beneficial outcomes for students) against a rationale ethic (i.e., suggestions and expectations from researchers and administration). However, many studies have identified a list of other barriers hindering teachers from adopting new technologies such as video games in their everyday pedagogical practice, including teacher's beliefs and attitudes, technological pedagogical content knowledge, a lack of relevant experience, institutional challenges, lack of time and resources, and an overwhelming focus on exam results (Albirini, 2006; Watson, Yang, & Ruggiero, 2013).

Factors Influencing Teachers' Adoption of Video Games

Even though video games have become a well-known pastime across all social groups, the use of digital games in formal teaching has remained on the sidelines of research interest (Blume, 2019; de Grove, Bourgonjon, & Van Looy, 2012). A study (de Grove et al., 2012) broadly working in a social cognitivist framework

used structural equation modelling (SEM) to understand the factors influencing the acceptance of digital games in the classroom and found that the perceived usefulness, ease of use, and learning opportunities afforded by digital gaming were the strongest predictors of teachers' intention to use video games in their classes, underlain by teachers' experience with computer games that factored into perceptions about ease of use and curricular relatedness.

Still outside the context of language learning, Becker (2007) offered an interesting insight into the development of teacher cognition regarding video games: teachers who were afforded the opportunity to acquaint themselves with game design reported a newfound sense of relatedness to their learners engaged in gaming by understanding more about video games and gaming culture even without becoming regular gamers themselves.

As far as the context of English language teaching is concerned, Blume (2019) pointed out that despite the fact that numerous other digital and especially computer-assisted language learning (CALL) technologies have gradually entered the practice of English language teaching (Albirini, 2006; Burston, 2014; Li & Walsh, 2010), it is argued that digital games have not found their way into the English language classroom. Her research succinctly points out an important discrepancy between educational beliefs that young digital native (as per Prensky, 2001) pre-service teachers are the "gatekeepers to technological change" (Blume, 2019, p. 2) and the actual relative lack of digital knowledge and competence on pre-service teachers' side as attested by her results. Her results also indicate the relevance of the apprenticeship of observation effect (Moddie, 2016; Pajares, 1992) on pre-service teachers' beliefs about digital technologies and video games, as their experiences of learning English in high schools were found to be significantly correlated with their beliefs.

A Summary of the Role of Teachers' Beliefs, Knowledge, and Attitudes

Based on the brief review of literature in this section, it is argued that experience with gaming must be a cornerstone to positive attitudes about games, which might manifest itself in teachers helping their students exploit the learning potential in video games. Arguably, the degree of connection with games (i.e., whether it is first-hand experience or experience connected to close friends or

relatives) might be an important factor in the formation of such positive attitudes. Importantly, such experience can positively influence teachers' attitudes towards gaming, their perceptions of the usefulness of gaming, and the perceptions of games' relevance to the process of language learning.

It must be noted, however, that despite the apparent importance attributed to beliefs and attitudes in pedagogical processes, multiple studies have pointed to discrepancies between beliefs and actual in-class behavior (Basturkmen, 2012; Phipps & S. Borg, 2009), all stemming from the complexity of teaching as a profession and a vast array of institutional, personal, and interpersonal hindrances. Thus, teachers' responses in the present study may not be fully reflective of their actual teaching practice

The present study, therefore, focused on teachers' beliefs, knowledge, and attitudes towards the nature and perceived potential of learners' contact with English in out-of-classroom settings (extramural English), particularly in the context of gaming, and how that set of beliefs and attitudes may have an effect on teachers' decisions to recommend out-of-school activities such as playing video games.

Methods

Based on the above outlined issues related to teacher cognition and its relevance to the incorporation of video games in teaching practice, the following three research questions were posited:

1. What are Hungarian teachers' views of language learners who they perceived as gamers in terms of their proficiency, motivation, self-confidence, and in-class engagement?
2. Are there any differences in Hungarian teachers' contact with and perceptions of video games as compared to other out-of-school English-mediated activities?
3. To what extent are Hungarian teachers' attitudes towards recommending video games for language learning a function of their age, contact with video games, and beliefs about the usefulness of gaming for language learning?

Research Design

With the above research questions in mind, a study in the quantitative paradigm was designed to gain a general cross-sectional snapshot of the views of Hungarian English language teachers on video games. Therefore, the study included an online questionnaire with a sample of 100 teachers, and the collected data was analyzed using statistical procedures in IBM SPSS 24.

Participants

In order to present a relatively representative sample of the Hungarian population of teachers and to shed light on a phenomenon that is seemingly ubiquitous in Hungary, the author attempted to involve English language teachers from all around the country, representing all types of primary and secondary education.

The sample for the teacher questionnaire consists of 100 Hungarian teachers of English as a foreign language. The participants were around 44 years of age ($M = 43.91$, $SD = 10.26$) and have had experience as teachers of English for 19 years on average ($M = 19.05$, $SD = 10.17$). The participants in the sample were predominantly females, with 88 female respondents completing the questionnaire compared to 12 males; however, this distribution very closely reflects the general Hungarian gender distribution of language teachers (Öveges & Csizér, 2018). As there was a conscious effort to involve participants from a variety of different schools and school types, and also from a number of different locations in Hungary, the predominant sampling method for contacting participants was snowball sampling as recommended by Dörnyei (2007). This non-probability sampling method involved the author consciously attempting to find participants from different regions of Hungary, and then asking them to share the online questionnaire with local colleagues. The resulting sample, therefore, included a relatively equal number of teachers from primary schools (általános iskola), secondary grammar schools (gimnázium) and secondary vocational schools (szakgimnázium, szakközépiskola), with 34, 38, and 28 respondents, respectively. Furthermore, the resulting sample included 36 teachers from Budapest, the capital city, 28 from various towns with county rights (megyei jogú város), and 35 from smaller towns or villages. Therefore, the location-based distribution is also relatively equal, albeit Budapest is slightly overrepresented when compared to the actual distribution of the population.

Instrument

The instrument used to collect quantitative data for the research questions was an online questionnaire using Google Forms. The participant teachers were asked to provide factual background information (sex, age, location of school, computers/games consoles at home, own/relatives'/friends' gaming habits), attitudinal information about their beliefs about and attitudes toward video games and their potential for language learning, and behavioral data about their experience with gaming and the extent to which they incorporate video games in their in-class teaching and/or recommend them as an extracurricular activity. Several items and scales of the questionnaire included questions about experience of and beliefs about out-of-school English learning to serve as a point of comparison for experience with and beliefs about video games.

Before the data collection instrument went live online, a small-sample ($N = 28$) pilot was conducted in which the participants could also add comments at the end of the questionnaire to help improve the instrument. Based on the pilot data and feedback, the wording of several items on scales showing lower-than-acceptable reliability were refined for the live phase.

The close-ended part of the questionnaire consisted of 46 items recorded on a 5-point Likert-scale with some questions eliciting background information. The following is a list of the scales used in the data collection process, with a description of the theoretical construct, a sample item, and the number of items on the scale.

1. Perceptions of gamer-learners' proficiency (3 items): This scale was designed to measure whether teachers perceive gamer-learners as more proficient speakers of English than their non-gamer counterparts. Sample: "I think that those learners of mine who play video games speak better English than non-gamer learners."

2. Perceptions of gamer-learners' linguistic self-confidence (3 items): This scale measured whether teachers perceive gamer-learners to be more confident in their use of the English language than their non-gamer counterparts. Sample: "I think that those learners of mine who play video games are generally more confident to speak than others."

3. Perceptions of gamer-learners' in-class engagement (3 items): This scale was designed to measure whether teachers perceive gamer-learners to be more

actively engaged in the English lessons than their non-gamer counterparts. "I think that learners who are active gamers are more engaged in the classroom English lessons."

4. Perceptions of gamer-learners' language learning motivation (3 items): This scale measured whether teachers perceive gamer-learners to be more motivated to learn English than their non-gamer counterparts. Sample: "I think that those learners of mine who play video games are generally more motivated to learn English than others."

5. Perceptions of the usefulness of gaming for language learning (3 items): This scale was designed to measure the extent to which teachers feel that gaming is useful for potential gains in English proficiency. Sample: "I believe that playing computer games is a useful tool for learning English."

6. Positive attitudes towards video games (3 items): This scale was designed to measure the extent to which teachers feel positively about video games. Sample: "I find the world of video games interesting."

7. Recommending out-of-school English activities for language learning (5 items): This scale was designed to measure how much teachers recommend different out-of-school English-mediated activities for learners to practice English. Sample: "I recommend to my learners that they watch TV series to improve their English."

8. Recommending gaming as an activity for learning English (3 items): This scale measured how much, as a point of comparison to the previous scale, teachers recommend playing video games as a means of practicing English. Sample: "I recommend it to my learners that they play video games to improve their English."

9. Teachers' own experience of out-of-school learning (5 items): This scale was designed to measure the extent to which teachers, by their own admission, learned English themselves from out-of-school activities. Sample: "As a learner of English, I used to learn a lot by reading English books."

10. Teachers' own experience adopted into methods (4 items): This scale was designed to measure the extent to which teachers feel their own experience of learning English has translated into their methods. Sample: "The way I teach English is closely based on how I used to learn English as a learner."

11. Teachers' extramural contact with English (5 items): This scale measured teachers' general everyday extramural contact with English at the time of the data collection. Sample: "I often read English language books and/or magazines in my free time."

12. Teachers' experience with gaming (3 items): This scale measured the frequency of teachers' first-hand or second-hand experience with gaming. Sample: "I often play English language video games in my free time."

13. Teachers' knowledge about students' out-of-school activities (6 items): This scale was designed to measure how much teachers think they know about their students' involvement in out-of-school activities in general. Sample: "I am aware of what kind of English-language TV series my students watch in their free time."

Data Analysis

In order to explore the collected data, firstly, the scales were analyzed for reliability using Cronbach's Alpha reliability analysis in SPSS, showing the inter-relatedness of the items on a scale measuring a latent construct. Then, further statistical analyses were performed using background information as independent variables to find whether there are statistically significant differences between groups (e.g., males/females, capital city/town/countryside, school types, years of English teaching, computers or gaming consoles in the household). Furthermore, simple linear regression and multiple regression analyses were performed to find relationships between the different constructs. The sample size of 100 was deemed inadequate to subject the data to structural equation modelling (SEM) as most guidelines recommend a minimum sample size of 150 or 200 (Hoogland & Boomsma, 1998; Kline, 2005). Therefore, instead of SEM, a path analysis using multiple linear regression in SPSS was performed to find variance-based relationships between scales computed out of the items after various tests of reliability.

Results and Discussion

Reliability Analysis of the Scales

The scales designed for the study were first subjected to Cronbach's alpha reliability analysis in SPSS, which showed the inter-relatedness of the items on a scale measuring a latent construct. As Table 1 (next page) shows, 12 of 15 scales were found to have a reliability coefficient of over .7 as recommended by Dörnyei (2007), with the *Engagement* scale having a markedly poor reliability ($\alpha = .495$). Two scales, namely *Contact with gaming* ($\alpha = .691$) and *Adoption of own experience to methods* ($\alpha = .633$) were found to have a reliability deemed questionable (DeVellis, 2012); however, due to the perceived importance of the *Contact with gaming* scale to the understanding of teachers' beliefs and attitudes and the closeness of the reliability coefficient to the advised .7, the *Contact with gaming* scale was retained for further analyses. The other two scales mentioned above (*Engagement*, *Adoption*) were not computed into index variables for subsequent statistical analyses due to their low reliability.

Teachers' Perceptions of Gamer-learners' Proficiency, Self-confidence, Engagement, and Motivation

The present research question was focused on Hungarian teachers' views of gamer-learners' proficiency, motivation, self-confidence, and in-class engagement. Crucially, all items on the scales were phrased in a way that teachers had to mark their perceptions of gamer-learners relative to the entirety of their students (e.g., "I feel that students of mine who play video games are more active during the lessons than other students."). As the midpoint of a 5-point Likert-scale is 3, mean values above 3 could be interpreted as gamer-learners being perceived as more proficient users of English or more self-confident in their use of English. Overall, teachers perceived their gamer-learners as generally more proficient ($M = 3.62$; $SD = .397$), slightly more confident in their use of English ($M = 3.38$; $SD = .117$), marginally more motivated to learn English ($M = 3.19$; $SD = .496$), and only slightly more engaged in learning in English lessons ($M = 3.16$; $SD = .21$).

Table 1.

Cronbach's Alpha Measures of Reliability for the Scales and Descriptive Statistics

Scale	Nr. of items	Cr. alpha	Mean	St. Dev.
Perceptions of gamer-learners' proficiency	3	.813	3.62	.39
Perceptions of gamers-learners' linguistic self-confidence	3	.832	3.38	.11
Perceptions of gamer-learners' in-class engagement	3	.495	3.16	.21
Perceptions of gamer-learners' motivation	3	.830	3.19	.49
Perceptions of the usefulness of gaming for language learning	3	.721	4.07	.12
Positive attitudes towards video games	3	.878	3.5	.98
Beliefs about in-school language learning	4	.834	4.04	.74
Beliefs about out-of-school language learning	5	.908	4.81	.47
Recommending out-of-school English activities for language learning	5	.846	4.24	.75
Recommending gaming as a means of language learning	3	.768	3.78	.92
Own experience of out-of-school learning	5	.765	3.76	.82
Adoption of own experience to methods	4	.633	3.33	.69
Extramural contact with English	5	.747	3.77	.76
Contact with gaming	3	.691	3.37	.95
Knowledge about students' out-of-school activities	6	.863	3.37	.8

A statistical procedure to measure whether the observed values are statistically significantly different from a hypothesized mean is a one-sample t-test, where the hypothetical test value is marked as 3. Although the Normal Q-Q plots of the variables showed a graphically normal distribution, a one-sample Kolmogorov-Smirnov goodness-of-fit test found that all values on all three scales were non-normally distributed ($p < .05$). Therefore, instead of a one-sample t-test, a nonparametric one-sample Wilcoxon Signed-Ranks Test was used with a hypothesized median of 3. The Wilcoxon Signed-Ranks Tests indicated that the observed data on both the *Proficiency* scale ($Z(100) = 6.509$, $Mdn = 3.667$) and the *Self-confidence* scale ($Z(100) = 4.31$, $Mdn = 3.333$) both significantly differed from the hypothesized median of 3 ($p < .05$), while the data from the *Motivation* scale was not found to be significantly different.

To the author's knowledge, this finding is unique: no other quantitative study so far has focused on teachers' perceptions of gaming. As for parallels with the qualitative data of Chik (2011, 2012), the teachers in the Hungarian

sample held on average more positive beliefs of the linguistic and non-linguistic affordances of playing COTS video games than their Hong Kong counterparts; however, this might also be explained by the 8 years between the two studies, during which gaming has arguably permeated the general sphere of educators to a greater degree.

Although Henry (2013, 2014) had suggested a lack of motivation and engagement for gamer-learners due to the lack of in-class authenticity felt by gamer-learners, the data yielded by the present study did not find significantly different levels of engagement and motivation, at least according to teachers' perceptions.

Although teachers' perceptions of gamer-learners relative to other learners were not compared with two different sets of variables respectively, but to a hypothesized central tendency, the results still can be interpreted as implying that in the experience of the teachers in the sample, the gamer-learners are significantly more proficient in English and are more self-confident in using English. It is believed that the main merit of this element of the study is in uncovering teachers' underlying beliefs about gaming, which should serve as a basis for later pedagogical recommendations.

Teachers' Contact and Perceptions of Video Games and Gamers

The second research question was concerned with differences between teachers' contact with and perceptions of video games as compared to other out-of-school English-mediated activities. Based on prior research (e.g., Blume, 2019), it is hypothesized that teachers will be less knowledgeable about video games and will be less likely to recommend video games than other English-mediated out-of-school activities.

Five scales were of relevance to the analysis: firstly, *Extramural contact with English* (5 items) and *Contact with gaming* (3 items) collected data that could be used to compare teachers' own personal contact with gaming and other English-mediated activities; secondly, the *Knowledge about students' out-of-school activities* scale collected answers regarding how aware teachers are of their students' extracurricular activities, including gaming (represented with one item); lastly, two scales (*Recommend out-of-school English activities* and *Recommend gaming as a means of*

language learning) reflect how likely teachers are to suggest that their learners engage in a variety of English-mediated out-of-school activities (e.g., video games, watching films and series, reading books). The descriptive statistics of the items covering the abovementioned activities can be found in Table 2, where an additional *Non-video game* row is included that represents an aggregate of all activities other than video games.

A variety of statistical tests were performed on the data to find differences between the activities based on central tendencies. The preliminary normality tests (one-sample Kolmogorov-Smirnov goodness-of-fit test) showed non-normal distribution for the data on each scale ($p < .05$); therefore, a nonparametric related-samples Wilcoxon Signed-Ranks Test was used to compare the median values of gaming and non-gaming scales to find statistically significant differences.

Table 2.

Descriptive Statistics for Various English-mediated Out-of-school Activity Items on the Three Related Scales

	Mean values (<i>SD</i>) of <i>Contact</i> items	Mean values (<i>SD</i>) of <i>Knowledge</i> items	Mean values (<i>SD</i>) of <i>Recommending</i> items
Video games	3.37 (.8)	3.16 (1.19)	3.78 (.927)
Films	4.18 (1.04)	3.62 (.92)	4.7 (.61)
TV series	3.75 (1.34)	3.57 (.99)	4.41 (.98)
Internet content	4.5 (.86)	3.07 (1.02)	4.32 (1.01)
Books, magazines	4.11 (1.08)	3.37 (1.07)	4.49 (.986)
Music	4.23 (1.12)	3.46 (1.04)	4.35 (1.09)
Non-video game	4.15 (1.01)	3.41 (.98)	4.45 (.95)

The first medians-based test was performed on the *Contact* scales, where the Wilcoxon Signed-Ranks Test found a statistically significant difference between teachers' personal *Contact with video games* and other (non-video game) English-mediated activities ($Z(100) = -5.26, p < .05$).

In terms of teachers' self-reported knowledge about their learners engagement in non-gaming outside-of-school activities and video games, the Wilcoxon Signed-Ranks Test yielded a significant difference between these two

facets of *Knowledge* ($Z(100) = -1.98, p < .05$) implying that teachers are significantly less knowledgeable about their learners' engagement in video games than that of other activities.

As far as the *Recommending* scale is concerned, the Wilcoxon Signed-Ranks Test found a significant difference between the likelihood of teachers endorsing games and other English-mediated activities ($Z(100) = -4.501, p < .05$), showing a significantly lower likelihood of teachers recommending games for language learning purposes than other activities.

As a conclusion for the results related to Research question 2, the results yielded by the statistical procedures imply that teachers in the sample are in general less knowledgeable about games and gamer-learners and are less likely to recommend games for language learning. The findings parallel those of Blume (2019), who reported a general lack of experience and related less positive beliefs about gaming in language learning with pre-service teachers. Furthermore, despite almost a decade's difference between Chik's studies (2011, 2012) and the present study, the findings reported here show that there has probably (as the data cannot be compared straightforwardly) been little change as to teachers' knowledge about video games.

It must be pointed out that although the differences are significant, they are most definitely not as sharp as one might have predicted: teachers in the sample turned out to be generally knowledgeable and not at all dismissive about video games. Altogether, the findings presented here should serve as a call to attend to the fact that video games, a cultural artefact with profound effects and wide-spread proliferation in the last decade, are still in the blind spots of teachers, and as such, the data presented here may also serve as an important basis to inform teachers, school principals, teacher trainers, and educational policymakers involved in the development of teaching professionals.

A Pathway Model Explaining Teachers' Attitudes, Perceptions, and Willingness to Recommend Games

The importance of the findings for the previous two questions is particularly relevant to Research question 3, whose focus was on finding possible explanatory variables behind teachers' attitudes towards recommending games as a means

of language learning, with due regard paid to teachers' age, contact with video games, beliefs about the usefulness of gaming for language learning, and experience with gamer-learners as independent variables in the analysis.

As a means of understanding what variables may have an impact on the likelihood of teachers recommending games for language learning, multiple linear regression was used with *Recommending video games* as the dependent variable and *Age*, *Attitudes towards video games*, *Contact with video games*, and *Perceived usefulness of video games* acting as independent variables. The method of analysis for linear regression was set to 'Stepwise', meaning that an automatic fitting procedure in the software filtered out non-significantly correlated variables from the regression model.

Table 3.

Regression Analysis Summary for Predicting Recommending video games
(* $p < .05$)

Independent variable	<i>B</i>	<i>SE B</i>	<i>Beta (β)</i>
<i>Attitudes towards video games</i>	.632	.075	.539
<i>Perceived usefulness of video games</i>	.508	.125	.325
<i>R</i> ²		.651	
<i>F</i>		77.758*	

As was shown in Table 3, the results of the regression indicated that two predictor variables, attitudes towards video games ($\beta = .539$, $t = 6.667$; $p < .001$) and teachers' perceived usefulness of video games for language learning ($\beta = .325$, $t = 4.01$; $p < .001$), explained 65.1% of the variance ($R^2 = .651$; $F(2,97) = 93.423$; $p < .05$). Crucially, the analysis showed that neither the teachers' age nor their contact with video games emerged as a strong predictor for recommending that their students play video games.

In order to find out whether age, contact with video games and experience with gamer-learners were in any way related to the regression model, a pathway analysis was performed, in which the two independent predictor variables served as a subsequent dependent variable for each

analysis, which altogether would comprise a pathway model. Firstly, *Attitudes towards video games* was used as a dependent variable with the remaining variables (*Perceptions of the proficiency of gamer-learners*, *Age*, *Contact with video games*) serving as independent variables. As presented in Table 4 below, the results of this multiple linear regression analysis showed two predictors explaining 40.5% variance in the dependent variable ($R^2 = .405$; $F(2,97) = 34.697$; $p < .05$): *Contact with video games* ($\beta = .584$, $t = 7.438$; $p < .001$) and *Age* ($\beta = -.195$, $t = -2.482$; $p < .05$). The yielded statistics show that more first- or second-hand contact with video games results in more positive attitudes towards them, and that older teachers tend to hold slightly less positive feelings towards video games.

Table 4.

Regression Analysis Summary for Predicting Attitudes towards video games (* $p < .05$)

Independent variable	<i>B</i>	<i>SE B</i>	<i>Beta</i> (β)
<i>Contact with video games</i>	.606	.081	.584
<i>Age</i>	-.018	.007	-.195
<i>R</i> ²		.405	
<i>F</i>		34.697*	

A second strand of regression analysis was performed with *Perceived usefulness of video games* serving as a dependent variable. The analysis showed a linear regression model (see Table 5 below) in which 32.6% of the variance ($R^2 = .326$; $F(2,97) = 23.432$; $p < .05$) in the dependent variable was explained by two predictor variables: *Perceptions of gamer-learners' proficiency* ($\beta = .387$, $t = 4.534$; $p < .001$) and *Contact with video games* ($\beta = .343$, $t = 4.016$; $p < .001$).

Table 5.

*Regression Analysis Summary for Predicting Perceived usefulness of video games for language learning (*p < .05)*

Independent variable	<i>B</i>	<i>SE B</i>	<i>Beta (β)</i>
<i>Perceptions of gamer-learners' proficiency</i>	.368	.081	.387
<i>Contact with video games</i>	.254	.063	.343
<i>R²</i>		.326	
<i>F</i>		23.432*	

In order to gain further insight into the factors underlying teachers' cognition related to video games, Spearman's ρ correlations were calculated for the three scales (*Contact*, *Attitudes*, and *Age*) that were found to be important predicting variables in the regression models. The correlation matrix (see Table 6 on the next page) for the three variables tested for showed a strong and statistically significant bivariate correlation ($\rho = .673, p < .01$) between *Contact* and *Attitudes*, which can ostensibly be interpreted as first- or second-hand experience positively influencing attitudes towards video games, with positive attitudes logically motivating people to engage in more gaming or related activities. Interestingly, the data shows that teachers' age is not an important factor in the complex picture related to gaming: age was not significantly correlated with contact and was only weakly, though significantly and inversely correlated ($\rho = -.244, p < .05$) with *Positive attitudes towards gaming*.

Table 6.

Spearman's ρ Rank-correlation Matrix of the Age Variable and the Attitudes and Contact Scales ($p < .05$, ** $p < .01$)*

Correlation matrix	Age	Attitudes towards video games	Contact with video games
Age	-	-.244*	-.126
Attitudes towards video games	-.244*	-	.673**
Contact with video games	-.126	.673**	-

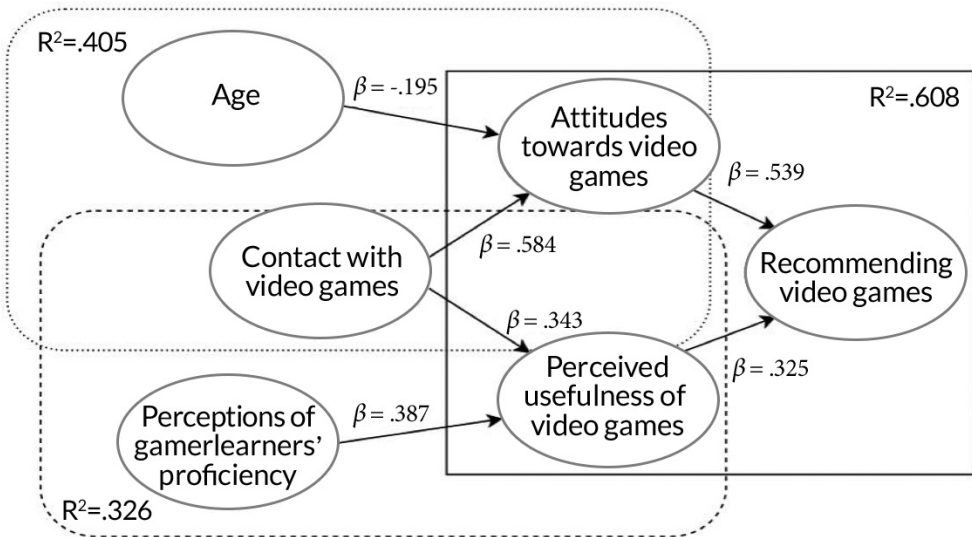
Lastly, a moderate and significant correlation was found between the *Perceived usefulness of gaming for language learning* and the *Perceptions of gamer-learners' proficiency* ($\rho = .496, p < .01$), which could be interpreted not only as a one-way influence of experience-based perceptions of gamer-learners' higher proficiency on the overall usefulness of gaming, but also as a general theory of the effectiveness of gaming in terms of language learning possibly increasing teacher awareness of gaming, as a result of which teachers are able to recognize learners who benefit from gaming.

Based on the connections discovered using regression analysis, a pathway model was drawn up (see Figure 1 on the next page) to explain the dependencies of the variables towards the likelihood of teachers recommending video games.

One of the key ideas emerging from the pathway model is that although *Contact with games* did not appear in the list of significant predictor scales of the likelihood that teachers recommend video games, it does exert an important influence on the key dependent variable indirectly through the *Attitudes* and *Perceived usefulness* variables. Furthermore, age was not found to be central to the pathway model, only exerting a weak negative influence on attitudes towards gaming.

Figure 1.

A pathway model of the dependencies between variables as yielded by multiple linear regression analyses



Regrettably, the sample size ($N = 100$) did not allow for a confirmatory factor analysis via structural equation modelling using individual observed items and hypothesized latent variables; however, it is seen as important that the present analysis and the emergent model can be used as a springboard and a point of comparison for further research on the topic utilizing larger sample sizes.

An important finding of the results presented here is the relative lack of importance of teachers' age related to their attitudes towards gaming, which is in line with the comments of Blume (2019), who had observed in Germany that despite beliefs that young digital native (as per Prensky, 2001) pre-service teachers may lead the change in this respect, their attitudes and lack of experience with gaming and its usefulness in language learning will definitely be a major hindrance to such profound changes.

It appears that there may be an overall openness on the teachers' part towards computer games; however, experience with games, which is also found to be crucial for change in the study of Albirini (2006) regarding ICT, is

sorely missing, even though it could strengthen these attitudes. As teachers' contact through first- or second-hand experience is seen to be at the core of the pathway presented in this section, the calls of Becker (2007) to incorporate experience with gaming and game design into teacher training are particularly resonant more than a decade later. Not only would becoming acquainted with video games help teachers develop a "cool" image among students, but it would also enable them to view games as a potentially effective tool for learning a language.

The prevalence of English-language games along with other English-language extramural activities in the everyday life of students is an opportunity seen as ripe for the taking for language teachers; however, it also requires a variety of different techniques and motivational strategies on the teachers' part (Henry et al., 2017) to harness the creative language learning opportunities found in artifacts designed for entertainment or simply non-educational purposes.

Conclusion

The focus of this study was on mapping teachers' beliefs regarding video games and their possible uses and usefulness in language learning. The analysis of the data collected for answering the research questions found a general sense of openness and positive attitudes on the teachers' part in regard to video games and their relation to language learning, especially as related to the results of Chik (2011). While the data showed that, similarly to the findings of Blume (2019), teachers lack the amount of experience necessary for implementing COTS games-based learning in their practice, they see video games as having potential as an outside-of-school activity that may help students improve. The findings of the analyses on teachers' knowledge and beliefs showed that teachers are generally less knowledgeable about gaming and learners involved in gaming than in other out-of-school activities, and would be less likely to recommend gaming as a source of language learning than any other activity. Crucially, the results showed that it is experience with video games (or contact) and not teachers' age that is key to fostering more positive attitudes about video games and more positive evaluations of their usefulness.

Several points can be identified which show the various limitations of the present study. It has already been mentioned that the sample size ($N = 100$) was not adequate to create a structural model with confirmatory factor analysis. In addition, as snowball sampling was used to draw in respondents for the questionnaire, a possible sampling bias also might have had an effect in skewing the data, as most probably it was more proactive teachers who filled out the questionnaire, and thus it cannot be claimed to adequately represent the population of Hungarian English language teachers. In order to obtain more robust findings, random sampling procedures should later be used to find teachers who are willing to participate; however, such procedures would definitely necessitate ample financial and institutional resources.

Based on the findings of the study, it is considered important that the suggestion be made that today's teacher training must cater to teacher trainees who are interested in harnessing the potentials of video games as an English-mediated activity in their teaching practice. Focusing on the fact that video games are useful is in itself insufficient if it does not involve creating an in-depth understanding of games, game types, contexts of gaming, and affinity spaces related to games.

Moreover, it would also be necessary to organize events for continuous professional development that cover a variety of issues related to gaming: providing experience in creating and/or playing video games for teachers, language learning profiles of gamer-learners, games best suited for language learning, possible in-class activities with games, and developing teachers' understanding of beyond-the-game English-language activities.

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