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Japan university EFL students' experience, attitudes, and perceived effectiveness of watching gameplay for language-learning purposes

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Digital game-based language learning (DGBLL) is a field that promotes language learning by combining game entertainment and mechanics inducive to learning. Researchers have proposed evidence of various language-learning benefits, yet downsides persist, such as negative stigmas, a lack of participation of non-gamers, and potential adverse consequences from splitting one's attention between controlling the gameplay and learning language. Recently, watching gameplay popularity has seen exponential growth, yet the potential for language-learning applications has not been considered. Soliciting stakeholders' experience, attitudes, and perceived effectiveness is a critical determiner of user adoption for new technologies and predicting implementation success. This study first addresses the merit of watching gameplay as a pedagogical method through an overview of the available literature, concentrating on areas of insufficiency and opportunity. It then investigates students' experience and perceptions to consider feasibility from a practical standpoint through a survey of 139 university students in Japan. The main findings include a higher proportion of watchers than players, including a higher percentage of females, and positive responses regarding ease of use, learning opportunities, and preference, especially for learners who play or watch games. But learners also expressed a need for scaffolding support while voicing limitations in the perceived quality and practicality of the learned language.

Keywords: watching gameplay, game-based language learning, English as a foreign language, English learning, attitudes and perceptions

Introduction

Digital game-based language learning (DGBLL) is a research branch of computer-assisted language learning (CALL) that entails the study of how language acquisition may be facilitated through playing computer games. Games, digital or otherwise, possess inherent entertainment features beneficial for language learning that work to increase user motivation. Studies show that playing games brings several motivational advantages transferrable to learning, such as providing sufficient challenge, competition, purpose, and control (Admiraal, Huizenga, Akkerman, & Ten Dam, 2011; Nakamura & Csikszentmihalyi, 2009; Whitton, 2014). Game features also help with language acquisition, as researchers have also observed how games can foster learning through scaffolding and facilitating safe, immersive environments (Jabbari & Eslami, 2019; Steuer, 1992), immediate feedback (Kiili, 2005), and language negotiation through interaction and collaboration (Peterson, 2016). DGBLL entails platform applications ranging from mobile smartphone apps to gaming consoles and high-powered PCs and includes games either created by educators for educational purposes or developed by game studios for entertainment.

DGBLL can be separated into two types of games used. Commercial off-the-shelf (COTS) games are commercially produced solely for entertainment. After they are finished and released to the public, researchers manipulate them into opportunities for learning. Conversely, serious games, or 'edutainment' games, are designed from the ground up with educational goals as their primary function and entertainment mechanisms designed secondarily. While interest in DGBLL research has grown considerably recently, the majority of DGBLL studies pertain to serious games (Boyle et al., 2016; Dixon et al., 2022). Additionally, studies focus on users playing the games themselves. One under-researched area is the potential of watching games for language-learning purposes.

Watching gameplay is a phenomenon where viewers watch live or prerecorded gameplay footage of digital games online through websites like Twitch.tv and YouTube. When live, this occurrence involves two parties, the streamer and viewers. A streamer broadcasts their own gameplay while oftentimes providing game commentary and responding to viewers' chat messages. Viewers tune into the broadcast, watch the streamers' gameplay, and have the opportunity to communicate with the streamer or fellow viewers via a chat box. "Video game live streaming is a kind of real-time video social media that integrates traditional broadcasting and online gaming" (Li et al., 2020, p. 1). In recent years, its popularity has increased exponentially in terms of viewership and market value (Hamilton et al., 2014), with some websites boasting monthly viewership rivaling national television channels (Gilbert, 2018). And during the COVID-19 pandemic, Twitch.tv experienced a three-fold increase in its audience from 2018 to 2021 (Clement, 2021). In fact, studies have indicated cases where more people watch someone else play a game than play it themselves (Kaytoue et al., 2012). And while minimal evidence exists on game streaming popularity in Japan, a 2021 survey asking Japanese middle school students what kind of career they want to pursue surprisingly showed that "Game Streamer" was ranked top 5 for boys and top 10 for girls ("Awareness Survey," 2021).

Game streaming can entail either casual content or live competitive Esports events, the latter of which has dominated the attention of viewers, corporations, and, thus, researchers. With an estimated audience of 495 million (Jang et al., 2020), esports plays an essential role in game streaming. The industry generates approximately $1.1 billion USD annually (Newzoo, 2020), and large corporations sponsor major tournaments with substantial prize pools. Despite the rising popularity, there has been minimal consideration investigating the linguistic effectiveness of watching gameplay or language learners' motivation and perceptions of its effectiveness for language learning.

When considering watching gameplay for language learning, similarities can be drawn between traditional media-based learning such as movies, TV, and various other forms of media content. Nevertheless, traditional forms of media often rely on prerecorded applications for listening and viewing, both passive competencies, in an individual, isolated manner. Conversely, watching gameplay is often a social phenomenon, with multiple avenues of communication taking place between the streamers and viewers. Both playing games and watching gameplay offer opportunities for communication but express differences. Playing games involves interaction between fellow players working together to accomplish in-game objectives, which has been shown to be inducive to language learning (Peterson, 2016). Likewise, watching gameplay offers communicative opportunities between the streamer who plays the game and the audience. The former typically communicate orally while the latter utilize a chat box. Such interactions can include streamer-viewer, viewer-viewer, or even streamer-streamer communication in multiplayer scenarios.

Literature review

Recent research trends for the new streaming phenomenon

Given the rise in popularity of watching gameplay, researchers have rushed to explain the phenomenon, focusing primarily on live Esports streaming and non-linguistic aspects in particular. Most related research can be categorized into the subjects of online social interaction (Churchill & Wen Xu, 2016; Diwanji et al., 2020; Hamilton et al., 2014), media consumption (Jang & Byon, 2019; Sjöblom et al., 2017), and the general motivational appeal to watch (Gros et al. 2017; Sjöblom & Hamari, 2017). Studies on motivation do not indicate language learning as a factor. Nevertheless, data collection usually entails quantitative surveys with predetermined categories measuring items such as entertainment, communicating with others or the online community, checking out a game before purchasing it, and learning game strategies. Notably, viewers' motivation to learn another language is not a selectable item. Thus, researchers have not considered the possibility of utilizing watching gameplay's recent popularity for language learning benefits, and their survey question items have, in turn, excluded this criterion.

Whenever addressing new potential platforms for CALL applications, it is essential to consider two aspects. First, determining the linguistic efficacy of a

method will determine its pedagogical usefulness. Second, determining implementation feasibility will predict its adoption success because, without stakeholder volition, feasibility cannot be ensured regardless of how effective it is. This paper will address both aspects, while the focus and contents of data collection will be on the latter.

Relative linguistic benefits of watching versus playing

There is minimal data available on the potential linguistic effectiveness of watching a game versus playing one, especially for commercially-made games. In this regard, a major difference between the two is the utilization or exclusion of game physical interactivity; simply stated, a player uses a controller to manipulate the gameplay while a viewer does not. According to Taylor (2002, p. 20), video games' physical interface "requires frequent input from the player and the input required can disrupt the player's involvement with the game space." This can similarly be seen in the past with instructional media applications causing split attention and extraneous cognitive load (Kalyuga et al., 1999), factors not desirable for learning purposes. Cognitive Load Theory postulates that people's mental capacity is finite and that overwhelming the brain with mental tasks decreases the chances for target learning (Sweller, 1994). Measuring the effects of cognitive load is a popular topic within general DGBLL research, and Pass and Jones (2005) argued that cognitive load can be induced by user controller input and needs to be further addressed.

DeHaan, Reed, and Kuwada (2010) addressed comparative cognitive load and vocabulary retention for playing versus watching a music game in their study on university students in Japan. The results showed a lesser subjective cognitive load and higher vocabulary achievement for the watchers both in the immediate and delayed tests. The authors concluded that watching gameplay may have learning advantages over playing games because the watcher is free to concentrate on language learning rather than expend mental effort playing the game.

While the above article has been cited several hundred times, it is primarily referenced as evidence for arguing the negative aspects of *playing games* without conversely considering the relative advantages of *watching gameplay*. Additionally, numerous studies have followed DeHaan et al. (2010) in addressing the effects of physical interactivity on language learning in DGBLL. Yet, the vast majority utilize serious games (Ali Mohsen, 2016; Hitosugi et al., 2014; Hsu & Lin, 2016; Janebi Enayat & Haghighatpasand, 2019; Schwartz & Plass, 2014), which follows the previously mentioned recent shift of DGBLL studies predominantly focusing on serious games (Boyle et al., 2016).

The distinction between the types of games used becomes essential when considering that, while serious games make up the majority of research interest, all forms of popular gameplay watching are done predominantly through COTS games. At present, the author could find two studies relating to language education and testing the physical interactivity of a COTS game, and both used the same Multiplayer Online Battle Area (MOBA) game called DOTA.

In the first study, Ebrahimzadeh and Alavi (2016) tested 136 high school students over five weeks, measuring electronic learning (e-learning) enjoyment, flow, motivation, and vocabulary learning. Participants were divided into player or watcher groups consisting of five members each. The players played the game and were allowed to communicate with each other while the watchers simultaneously watched. The results showed e-learning enjoyment was correlated to vocabulary learning, but no significant differences were found in vocabulary learning between the two groups.

In the author's follow-up study (Ebrahimzadeh, 2017), 241 male high school students were put into groups of readers, players, and watchers over five weeks. For the readers group, essays were created based on the *Warcraft III* single-player campaign story with the target vocabulary inserted. The study's findings indicate that players and watchers outperformed the readers.

Finally, while unrelated to education, other studies have looked at COTS games and the role of physical interactivity pertaining to responsibility and degree of character identification in violent games (Walter & Tsfati, 2016), cognitive load and rape acceptance (Read et al. 2018), violence, perceived difficulty, and frustration (Polman et al., 2008), and motivational processing and cognitive load (Huang, 2011).

Altogether, given the minimal available data, conflicting results, and stagnation of interest in recent years, further studies should be conducted to update, solidify, and expand upon the available knowledge base of the effect of watching digital games on language acquisition.

Willingness to adopt CALL applications

I. Prior experience as a measure of feasibility. In addition to exploring the linguistic effectiveness of pedagogical styles, researchers have put considerable effort into assessing the implementation feasibility of various CALL applications by collecting data on stakeholders, namely educators and learners. This is essential when evaluating new learning technologies as specific predictors can determine stakeholder acceptance probability and, thus, adoption success. One such predictor includes having prior experience with a target technology because being familiar with the technology can assist with making adoption easier. Thus, researchers stress the importance of ascertaining data on stakeholders' experience with the target technology and their attitudes and perceptions of using the technology for learning purposes (Beavis et al., 2015). For example, researchers have frequently looked at students' usage of smartphone technologies to determine mobile-assisted language learning (MALL) applications feasibility (Metruk, 2020; Lai & Zheng, 2018), including Japanese university students (White & Mills, 2014).

Available data for DGBLL experience pertains to playing habits and behaviors. In the L1 environment, Beavis et al. (2015) collected data on primary and secondary school children's gameplay habits, indicating that males and females express differences in their preferred games, the purpose of playing games, and the frequency of gameplay. For L2 education, Blume (2019) collected 150

German EFL students' game-playing behaviors and attitudes, perceptions, and engagement of DGBLL. The results show positive attitudes for DGBLL but limited usage. Additionally, Bolliger, Mills, White, and Kohyama (2015) assessed Japanese university students' gameplay habits to assess using games in classroom education. The results showed most students viewed the implementation of digital games as positive, while some were skeptical about its effectiveness. There is minimal related data available pertaining to Japanese university students' watching gameplay experience. Yet the abovementioned survey of students in Japan indicates that watching gameplay is at least popular in middle school ("Awareness survey," 2021).

II. Attitudes and perceptions as a measure of feasibility. Next, it is critical to know stakeholders' perceptions and attitudes to determine implementation success. Likewise, the implementation may prove challenging if there are negative perceptions or low motivation, irrespective of how effective the method is determined to be. Thus, researchers have also looked at CALL adoption intention (Duan et al., 2010), willingness to adopt a technology (Beavis et al., 2015; Herzog & Katzlinger, 2011; McMorran, Ragupathi, & Luo, 2017), and perception of using online programs for language learning (Metruk, & Rafajlovičová, 2022), including specific platforms such as Google Forms (Alharbi, Alhebshi, & Meccawy, 2021), Moodle (Indriani & Widiastuti, 2021), and Kahoot (Mahbub, 2020; Tao & Zou, 2021). Recently, perceptions of learning through MALL applications have been commonly researched (Metruk, 2020).

For general game-based learning (GBL) applications, researchers have looked at stakeholder perceptions, often focusing on educators' willingness to use GBL in their classrooms (Bourgonjon et al., 2013; Can & Cagiltay, 2006; Kaimara et al., 2021; Schrader et al., 2006; Wu, 2015). Educators are sometimes reluctant to implement GBL practices based on the association of students just 'playing games' (Blume, 2019). Therefore, when addressing potential challenges to implementing GBL in classroom environments, associated negative stigmas are a prime focus (Gerber & Price, 2013; Wu, 2015).

In the broader field of Digital Game-based Learning, there are also several studies on stakeholder perceptions of learning a language through digital games, many of which report positive perceptions of learners (Alrajhi, 2020; Bolliger et al., 2015; Li et al., 2022; Suki et al., 2016; Udeozor et al., 2021). Yet, some learners express hesitancy regarding the effectiveness of learning a language with digital games (Bolliger et al., 2015). Educators are recently expressing general positive perceptions of digital games in education (Ardani & Setyaningrum, 2018; Dashtestani, 2022) but have hesitancies regarding the relative effectiveness (Ardani et al., 2018), ability to monitor students' activities and create instruction clarity (Ardani & Setyaningrum, 2018), and inability to easily incorporate games into their curricula (Dashtestani, 2022).

Overall, exploring new potential technologies for learning purposes requires investigating the feasibility, which can be determined by collecting data on prior experience, attitudes, and perceptions. And in an attempt to measure these

determiners of acceptance, studies often employ the Technology Acceptance Model (TAM) to solicit their data, including several mentioned above.

Measures of technology acceptance: technology acceptance model

Initially developed by Davis (1989), the TAM is a widely used model for technology acceptance research derived from the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and was created to assess predictors of users' computer technologies acceptance (Davis, 1989). It is founded on the assertion that when a learner expresses a greater acceptance of a new technology, a learning behavior is more likely to be instigated and maintained. The traditional TAM consists of five components: *perceived usefulness*, *ease of use*, *attitudes toward use*, *behavioral intention*, and *actual use*. Due to limitations in explaining the factors necessary for predicting usage (Legris et al., 2003), the TAM has been transformed into the TAM2 (Venkatesh & Davis, 2000) and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003). The TAM has also been used for educational applications to examine user acceptance of various learning technologies and in different platforms, such as mobile learning (Park et al., 2012). Other researchers have used the model to address the acceptance of digital games for various purposes (Bourgonjon et al., 2010; Ha et al., 2007; Hsu & Lu, 2004; Tao et al., 2009). Furthermore, Han & Kim (2006) and Ha et al. (2007) used the TAM to focus on mobile game acceptance. In their study, Bolliger et al. (2015) used the following factors to determine attitudes and perceptions: *perceived ease of use*; *learning opportunities*, which was previously proposed by Bourgonjon et al. (2010) and replaced *perceived usefulness*; *preference for digital games* (originally *behavioral intention* in the TAM); *actual use*; and *experience with games*, which has been shown to have an effect on acceptance and learning processes (Bourgonjon et al., 2010) and has been used in newer TAM (Venkatesh & Davis, 2000). The results showed moderate agreement for ease of use (2.73 out of 4), learning opportunities (2.7), experience (2.57), and preference (2.85).

Evidence indicating willingness to accept watching gameplay

In contrast to the available data on the experience, attitudes, and perceptions of implementing various technologies, there is minimal data available pertaining to watching gameplay for language learning purposes. Nevertheless, there is an indication that, in general, watching may attract a larger and more diverse population of learners. As previously mentioned, in some instances, more people watch gameplay than they play games (Kaytoue et al., 2012). Orme (2021) investigated this by interviewing people who only watch games. The results showed that the participants didn't play games because of the 'work' required to play them, their lack of skill, toxic online communities, and inaccessibility to playing games. Indeed, while playing games requires learning controls and mechanics (physical interactivity) unique to every game, watching games only requires viewers to watch (no interactivity). Next, there is a significant

distinction between users' access to playing games versus watching them due to the required hardware and associated price. Orme (2021) saw that the cost of game consoles and games was a hindrance, and Bollinger et al. (2015) argued that games are not used in classroom teaching because of the high expense for the necessary equipment. Contrarily, watching gameplay is achieved through internet connectivity using inexpensive and accessible platforms. Thus, when exploring the potential for pedagogical applications, the comparative simplicity and cost advantage is exponential.

Next, a large determiner of successful implementation entails being able to represent the interests of a broad demographic of learners. In this regard, a drawback of DGBLL is that it has traditionally been considered non-inclusive for people who do not play games. Specifically, a larger percentage of males play games than females (Clement, 2022b) for longer weekly hours (Clement, 2022a), albeit this gap is gradually shrinking. And "in general, female students are more hesitant to utilize digital games for learning compared with male college students (Bolliger et al., 2015, p. 403)." Thus, DGBLL applications may exclude a significant portion of the prospective learner population, and further female inclusion would be substantial. Given the recent overall exponential growth of watching gameplay, it is possible that females make up a significant portion of the audience, expressing more of an inclination to watch rather than play. Data shows males make up most of the game Twitch.tv watching audience (around 80% in 2022), but the proportion of female players is slowly increasing annually and is currently estimated to be around 20% (Twitch Demographics, 2022). Nevertheless, further investigation is necessary to consider potential gender differences that may exist as they do with playing games. Specifically, females may differ from males in game genres preference (Beavis et al., 2015; Cieślak, 2022) and motivation (Yee, 2016) and express unique vocabulary learning characteristics in game-based applications (Yu, 2018).

Research purpose and questions

To determine the feasibility of watching game streaming for language learning purposes, data on learner experience and perceptions is necessary. Given the lack of such evidence, this study focuses on university EFL learners in Japan with the purpose of 1) establishing an understanding of how the watching gameplay phenomenon is occurring in Japan universities and then 2) addressing the feasibility of implementation from a practical standpoint. Accordingly, the research questions are as follows.

Q1. What are learners' habits for technology usage, watching gameplay, and playing digital games?

Q2. What are learners' experience with and attitudes and perceptions of watching digital games to learn English from the perspective of ease of use, learning opportunities, and preferences?

Based on the results of Q1 and Q2, implementation and adoption feasibility can be assessed.

Methodology

Participants

The sample includes students from one campus at a university in Japan. The participants are taking English language classes and majoring in either economics or management of gastronomy. One hundred and fifty participants were invited to take the voluntary and anonymous survey. In total, one hundred and thirty-nine participants completed the survey (n=139), a response rate of 92.7%. Table 1 displays the participants' background information. More than half (63.3%) were male, and most (69.8%) majored in economics. Nearly all of the participants (98.6%) were first-year students. Many wrote "unknown" for their English proficiency scores or did not volunteer their results. Twenty participants wrote their TOEIC scores, the lowest being 340, the highest 989, and the mean 619.5.

Table 1. Participant profile

Major	
Economics	69.80%
Gastronomy	30.20%
Year	
1st	98.60%
2nd	n=1
3rd	n=1
Gender	
Male	63.30%
Female	36.70%

Note: for percentages, n= 139

Data collection and analysis

A survey was constructed consisting of three sections of data collection. The first section elicited demographic information focusing on students' experience, habits, and usage of electronic devices, as well as game playing and watching information. This included numerical data such as hours played and watched, Likert questions gauging the degree of usage of electronics and purpose of usage on a 4-point scale ranging from *Don't use at all* to *Frequently use,* and write-in answers to specify game and genre names.

The second portion consisted of 34 Likert question items derived from prior surveys, as existing questionnaires can be considered more reliable as they have been tested for validity and reliability (Alqurashi, 2016). All

question items were translated into Japanese by a native Japanese speaker with advanced English proficiency. Items 1–13 gauged the students' attitudes toward studying English and their current study effort. These questions were derived from Andersson and Nakahashi (2020) based on Dörnyei and Taguchi (2010). Specifically, the question items include *criterion measures*, which are the current level of effort to learn English (Q1–5); *attitudes to learning English* (Q6–9); and *interest in the English language* (Q10–13). These questions were administered to verify that students' motivational levels did not interfere with the results, as having low motivation may lead to a lower motivation to study English by any means.

Items 14–34 were derived from Bolliger et al. (2015), who utilized the questionnaire of Bourgonjon et al. (2010) that tests students' perceptions and attitudes toward playing digital games. Both of these questionnaires were based on the traditional TAM (Davis, 1989). There are four sections, including *ease of use*, *learning opportunities*, *experience*, and *preference*. The survey was adjusted to incorporate watching gameplay and specify the topic of English language learning. Following the methodology of Bolliger et al. 2015, the Likert questionnaire consisted of a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree) to prevent the participants from preferring a neutral option to avoid confrontation, as has been the case with Japanese students (Wang et al., 2008).

The final survey section included an open-ended free-form box for participants to write comments as a means to supplement the quantitative items with qualitative answers. Here, students were invited to further elaborate on their perceptions and attitudes towards learning English by watching gameplay.

Results

Responses to the questionnaire are displayed below. For the Likert survey portion, the means and standard deviations were calculated for the individual and grouped question items. Following the methodology of Boonmoh and Karpklon (2021), means were interpreted as follows: a score of 1.0–1.74 is interpreted as *strongly disagree* or *very low*, 1.75–2.49 *disagree* or *low*, 2.50 *neither agree nor disagree* or *neutral*, 2.51–3.25 *agree* or *moderate*, and 3.26–4.00 *strongly agree* or *very high*. Finally, students' comments were translated into English by a native Japanese speaker with advanced proficiency in English, and the results are listed below.

Demographics and habits

Table 2 shows the types of devices that students use. Most students rarely use desktop computers or tablets, and almost all students often use a laptop computer and cellphone.

Table 2. Electronic devices used

Item	Response (%)			
	Never	**Occasionally**	**Sometimes**	**Often**
Desktop computer	75.6	11.9	5.9	6.7
Laptop	1.4	2.9	15.1	80.6
Cellphone	0	0.7	1.4	97.8
Tablet	47.8	13	12.3	26.8

Table 3 shows the purpose of technology usage. There was wide consensus for using electronics to study and communicate. *Watching Movies/videos* was spread evenly between *Never* and *Often*. There were significant gaps for *Play Games* and *Watch Gameplay* between students who chose *Never* and *Often* (Play Games: Never 38.2% / Often 32.4%; Watch Gameplay: Never 44.4% / Often 31.9%).

Table 3. Purpose of technology usage

Item	Response (%)			
	Never	**Occasionally**	**Sometimes**	**Often**
Study	0.7	6.5	18.8	73.9
Watch movies/videos	25.5	21.2	21.2	32.1
Play games	32.4	9.6	19.9	38.2
Watch gameplay	44.4	8.9	14.8	31.9
Communicate	2.9	5.8	13.9	77.4

Table 4 shows the students' preferred method of studying English arranged from the highest to lowest percentages. Most students prefer to study with textbooks, video clips, movies, and cellphone apps. "Games" was selected less than a third (28.1%) of the time. However, when separating students between those who play or watch games versus those who do not, the percentage of students who watch or play games increased to 36.36%. The remaining students chose games 17.7% of the time, indicating some interest despite having minimal experience. Two students selected "other," and both wrote "music."

Table 4. Preferred method of studying English

Method of study	%
Textbooks	57.6
Video Clips	56.8
Movies	54.0
Cellphone Apps	51.1
Games	28.1
Flashcards	15.8
Other	1.4

Note: Multiple responses were acceptable.

Playing versus watching

Figure 1 displays the average weekly hours of playing games and watching gameplay. 42.4% of the students play digital games (n=59), while 57.6% do not. The highest weekly play time was 48 hours, the lowest was 1 hour, and the average was 13.1 hours. 48.9% of the students watch gameplay (n=68), and 51.1% do not. Regarding the duration of gameplay watched, the highest weekly viewing time was 40 hours, the lowest was 0.5 hours, and the average was 6.4 hours. Thus, a higher percentage of students watch gameplay than play games overall, but there was a much higher number of hours for playing games compared to watching gameplay. Of the students who play games, approximately half (48%) do so for more than 10 hours per week compared to most students who watch gameplay (86%) watching gameplay for only 1–10 hours. Additionally, there is a significant overlap as the majority of students who play games (50 out of 59) also watch them. Likewise, out of 80 students who do not play games, 18 still watch gameplay, averaging 5.36 hours of weekly viewing, the highest being 21 hours.
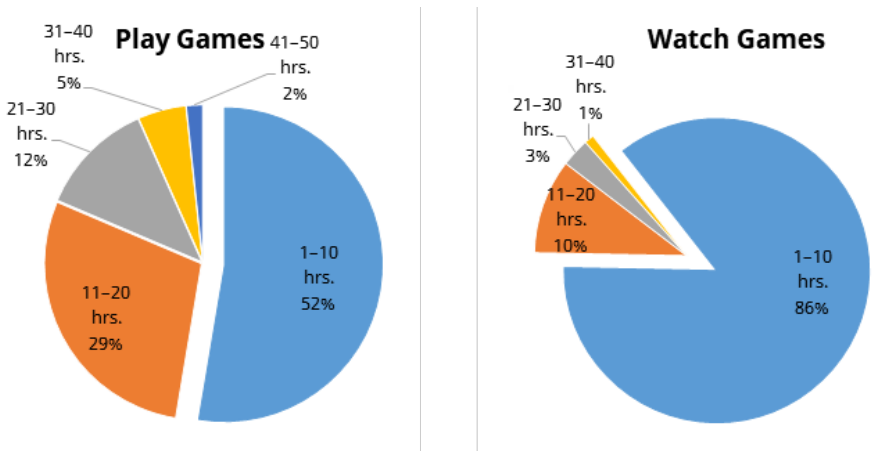
Figure 1. Average weekly hours of playing and watching games

Table 5 shows the genres students play games and watch gameplay, sorted by highest to lowest. Some answers given were main genres, while others included sub-genres of main genres, and these have been grouped collectively. First-person shooter (FPS) games were the most popular for both playing and watching. Specifically, the sub-FPS genre of Battle Royale is exceptionally popular. Role-playing Games (RPGs) and Fighting games are also popular amongst both. Differences were also expresses in that Sports games were chosen more for playing games whereas Horror and Racing games are more prevalent with watching gameplay.

Table 5. Genre of games played and watched

Genre played				Genre watched		
Genre	**Main & sub genre**	**Total**		**Genre**	**Main & sub genre**	**Total**
First-Person Shooter (FPS)	11			First-Person Shooter (FPS)	14	
Battle Royale (FPS sub-genre)	10*			Battle Royale (FPS sub-genre)	13*	
		21				27
Sports		16		Role-playing Game (RPG)	13	
Role-playing Game (RPG)	13			MMORPG (RPG sub-genre)	1*	
MMORPG (RPG sub-genre)	2*					14
		15		Fighting		7
Fighting		9		Horror		7
Sandbox		3		Racing		5
Social		3		Sports		5
Multiplayer Online Battle Arena (MOBA)		2		Social		4
Platform		2		Action		3
Others		1**		Sandbox		3
				Cards		2
				Multiplayer Online Battle Arena (MOBA)		2
				Platform		2
				Others		1***

* Sub-genre within a main genre
** 1 answer each for Cards, Puzzle, Racing, & Rhythm
*** 1 answer each for Puzzle, Group/party game, Real-time attack, Simulation, Third-person shooter, & World tournaments

Table 6 shows the method of gameplay and the source of watching gameplay, respectively. Most students play games with a gaming console (i.e., PlayStation or Switch) or a cellphone. The majority of students watch games on YouTube, Twitch.tv, or NicoNico Douga. Three students chose "other" and wrote *Mildom*, *Bilibili Douga*, and *OpenRec*.

Table 6. Method of playing games and watching gameplay

Playing games method		Watching gameplay method	
Source	**%**	**Source**	**%**
Gaming console	42.7	YouTube	74.7
Cellphone	41.7	Twitch.tv	17.2
Normal PC	9.7	NicoNico Douga	4.6
Gaming PC	5.8	Other	3.4

Table 7 shows the languages that the students play games and watch gameplay. Japanese ranked highest, followed by English. When adding all forms of selected English (English; Japanese & English; and Japanese, English & other), there were almost twice as many students who watch gameplay in English (22.38%) as those who play games in English (11.86%) due to a significant proportion of students watching gameplay in both Japanese and English (19.40%).

Table 7. Language of gameplay and watching games

Language	Play games %	Watch games %
Japanese	83.05	76.12
English	6.78	2.98
Japanese & English	5.08	19.40
Other	3.38	
Japanese & other		1.49
Japanese, English and other	1.69	

Note: playing games: 59/59 total responses; watching gameplay: 67/68 total responses due to 1 participant leaving this field blank

Gender and games

Table 8 shows the gender comparison for playing and watching games. The results show that males both play and watch games more than females, as well as for longer hours. Likewise, most females do not play games or watch gameplay. However, more than twice as many females watch gameplay (21.6%) compared to playing games (9.8%), but they play for half as long.

Table 8. Gender comparison for playing and watching games

Males		Females	
Item	Response	Item	Response
Play games		**Play games**	
Play games (yes)	61.4%	Play games (yes)	9.8%
Avg. weekly hours	13.3 hrs	Avg. weekly hours	11.6 hrs
Watch games		**Watch games**	
Watch games (yes)	59.1 %	Watch games (yes)	21.6%
Avg. weekly hours	6.8 hrs	Avg. weekly hours	4.2 hrs

Survey questions

The Likert questions are explained below. One response was removed because half of the questions were left blank. Four responses were missing 1 item each, and the missing data was replaced by the series mean.

Table 9 displays group means and standard deviations for all five questionnaire categories, and Appendixes B and C provide individual question item responses. First, the group mean for motivation and current effort to learn English was 2.79, indicating a moderate motivation to learn English. Items 1, 2, and 4 (Appendix B) relate to students' current effort, and the students marked this as moderate to low (2.74, 2.65, and 2.25, respectively). Item 4 was the lowest (2.25), indicating they feel they are less focused on studying English compared to other classmates. Items 3, 5, and 9 relate to the willingness to study English more, and the students marked it relatively high (3.02, 3.14, and 2.95, respectively). While they mostly want to study English even if it's not required (item 5: 3.14), they were comparatively less willing to take additional English classes (items 7 and 8: 2.65, 2.51). Items 6, 10, 11, 12, and 13 relate to linguistic interest, and students rated this as moderate (2.86, 2.64, 3.12, 2.86, and 2.88, respectively). Therefore, the students rated their overall motivation level as moderate, and it appears they have a linguistic interest in the English language and would like to study more. But they are less enthusiastic about taking additional English classes. This is understandable because their English classes are compulsory for them and differ from their primary coursework.

Table 9. Group means and standard deviations for questionnaire

Item (group)	M	SD
Motivation and effort to learn English	2.79	0.78
Ease of use	2.67	0.86
Learning opportunities	2.58	0.81
Experience with watching	1.99	1.02
Preference for watching	2.30	0.92

*Motivation and effort to learn English (13 question items); ease of use (6); learning opportunities (7); experience with watching (5); preference for watching (3). Scale ranges from 1 (strongly disagree) to 4 (strongly agree).

Next, the group mean for Ease of Use was 2.67, and when dividing students between those who watch gameplay and those who do not, those who watch had a higher group mean (2.93) than those who do not (2.43). In particular, Item 23, "I would know how to handle watching others play digital games (Appendix C)," had the highest overall standard deviation (1.02) among all students. When separating the students for this question, those who watch gameplay had a mean of 3.61 as opposed to 2.56 for those who do not.

For Learning Opportunities, the group mean was 2.58, and this was higher for students who watch gameplay (2.70) compared to students who do not (2.46). The highest variation of answers was with regards to whether they thought watching gameplay is more effective for learning English than playing games (Question Item 26: SD = 0.90). When separating Question Item 26 (Appendix C) between students who watch gameplay, play games, both, or neither, students who watch but do not play games rated the highest (2.78), followed by students who both play games and watch gameplay (2.51), and students who play

games but do not watch gameplay (2.33). Students who neither play nor watch gameplay scored the lowest (2.32). Table 10 compares the grouped means for Learning Opportunities between groups of students who play, watch, do both, or do neither. Students who only watch gameplay scored the highest (2.76), followed by students who both play games and watch gameplay (2.67).

Table 10. Comparative groups for learning opportunities of watching gameplay

Student group	M	SD
Both play games and watch gameplay	2.67	0.83
Watch gameplay but don't play games	2.76	0.73
Play games but don't watch gameplay	2.40	0.96
Neither play games nor watch gameplay	2.47	0.77

*Scale ranges from 1 (strongly disagree) to 4 (strongly agree).

Experience with Watching (Table 9) had the lowest group mean (1.99) and the highest variation of answers (SD= 1.02) in the survey. The highest in this group (Item 31) only reached only 2.19.

Finally, the group mean for preference for watching gameplay to learn English (Table 9) was 2.30 (see Appendix E for all items), and learners rated their enthusiasm for learning English this way (Question Item 34) at only 1.85. Additionally, Table 11 shows the group preference for watching gameplay to learn English, separated by students who play games, watch gameplay, do both, or do neither. Students who neither play games nor watch gameplay had the lowest preference (2.05). Compared to students who either watch, play, or do both, those who both play and watch scored the highest (2.53) but had a more significant variety of answers (SD = 0.92) than the next highest mean, which was those who only watch gameplay (M= 2.46, SD = 0.72).

Table 11. Comparative group preference for watching gameplay

Item	M	SD
Both play games and watch gameplay	2.53	0.92
Watch games, don't play games	2.46	0.72
Play games, don't watch games	2.41	1.05
Neither play games nor watch gameplay	2.05	0.88

*Scale ranges from 1 (strongly disagree) to 4 (strongly agree).

Participants' comments

The optional comment section yielded a total of 45 responses, and they have been grouped into categories by the author based on their content theme. One participant's comment, "I don't have the idea," was excluded due to an inability to interpret its vagueness. In total, six content themes were discovered,

including: generally good; can learn English while having fun; can learn effectively and learn natural English; good for people interested in games; effective if subtitles or other assistance is available; and the used language might have limitations or might not be desirable, practical, or easily understood. Some of the quotes are included in the discussion below, and the full list of the translated comments and their associated themes are shown in Appendix A.

Discussion

Q1. Technology usage, watching, and playing habits

The results of the survey's first portion establish a learner profile. They reveal that almost all (97.8%) use a cellphone often, which mimics prior survey results in Japan (White & Mills, 2014), and the majority (80.6%) frequently use a laptop computer, while most (75.6%) never use a desktop computer. Additionally, learners mostly use their electronic devices for communicating, followed by watching movies and videos and lesser on games. The results also indicate that most learners often use cellphones to fulfill much of their playtime, followed by gaming consoles. This may have implications for independent DGBLL learning regarding the availability of COTS games, as many game titles are exclusive to high-end PCs. Watching gameplay, conversely, can be accomplished through cellphones and other devices with internet connections. Universities in Japan are focusing on instilling independent learning competencies, investing heavily in Self-access Learning Centers (SALCs) and other supplemental programs. Here, watching gameplay may be better at promoting independent DGBLL learning through convenience and fewer barriers to entry.

For playing and watching habits, there was a wide range between learners who often play games or watch gameplay and those who do not. Compared to watching movies and videos, which saw an even distribution between *Never* and *Often*, there is a distinct separation between playing games and watching gameplay with limited middle ground; either they do it often or not at all. Additionally, learners mostly play games using gaming consoles (42.7%), followed by cellphones (41.7%), the latter percentage supporting the assertion of Japan being one of the primary purchasers of gaming apps internationally (Warman, 2013). Oppositely, the majority do not use PCs for gaming. DGBLL applications entail various platforms encompassing all platforms stated above, and serious games, in particular, have seen a rise in cellphone apps. Nevertheless, the selection of games for COTS applications is reliant on their available platforms. This creates limitations when certain titles are developed as PC exclusives due to their high-end requirements or suitability with a mouse and keyboard. For this reason, the 'strategy' genre of games is predominately PC-only. This may create limitations for autonomous DGBLL applications through COTS games, and game inaccessibility, as stated before, is a reason for people watching rather than playing games (Orme, 2021).

Next, almost three-quarters of the learners who watch gameplay use YouTube rather than Twitch.tv despite the latter being the most commonly

recognized source for watching gameplay. Watching gameplay is often discussed as a live phenomenon, and Twitch.tv is commonly associated with live streaming and tournaments. Conversely, much of YouTube's content has traditionally been prerecorded. Nevertheless, both websites currently provide options for live and prerecorded content, and the distinction between these formats and the implications for pedagogy is under-addressed. Live sessions offer synchronous communication with streamers and viewers, while prerecorded ones have asynchronous communication through the comment section. Additionally, while live sessions may encourage learners to participate in discussions, prerecorded sessions could offer additional assistance, such as the ability to pause and rewind and add subtitles, which several learners in this study voiced their desire. Future studies assessing learners' preferences and learning implications would be beneficial.

When comparing the students' habits for playing games versus watching gameplay, the findings show a slightly larger population of watchers (48.9%) than players (42.4%), matching the finding of Kaytoue et al. (2012). Additionally, the majority of students who play games also watch them; of the 59 students who play games, only nine do not watch gameplay. In contrast, this number is doubled (18) for learners who watch gameplay but do not play games. In this sense, we may predict that if students were to engage in just one of these, they would be more likely to watch gameplay.

In assessing gender inclusivity, the collective data shows males both play and watch games significantly more than females, which is typically the case (Clement, 2022). Yet, this study also indicates that, while most females neither play games nor watch gameplay, more than twice as many females watch gameplay (21.6%) compared to those who play games (9.8%). And all females who play games also watch gameplay, but out of the 12 females who watch gameplay, only 5 of them play games. Overall, this indicates that watching gameplay is more popular and may be comparatively more inclusive for females.

Yet, while more learners watch games, the hours of playing games significantly exceeded that of watching gameplay. Almost all learners (86%) who watch gameplay do so for only 1-10 hours a week, whereas nearly half of the learners surpassed or significantly exceeded 11 hours of playtime. Additionally, the overall average weekly playtime doubled the watch time.

Next, Japanese was the primary language of choice for both playing games and watching gameplay, and more students watch gameplay in English than play games in English. There may be two explanations for choosing English. One possibility is that students interested in games seek ways to learn English via a method they enjoy. Yet, this may also be due to necessity from less content being available in Japanese. Future studies can distinguish this.

Finally, students rated *Textbooks* as the most preferred method of studying (57.6%), followed by *Video Clips* (56.8%), *Movies* (54.0%), and *Cellphone Apps* (51.1%). Less than a third of the students chose *Games* (28.1%). Thus, the overall trend was that the traditional method of learning through textbooks remains popular, along with the introduction of media learning through videos and

apps. Conversely, the idea of learning through gameplay is comparatively less apparent.

Q2. Experience, attitudes, and perceptions for watching games to learn English

Next, learner experience, attitudes, and perceptions will be discussed based on the interpretation of the Likert survey and open-ended question. First, Experience With Watching had the lowest group mean (1.99) and the highest variation of answers (group SD = 1.02) in the survey. The highest deviation was from Question Item 31, "I watch people play different types of digital games." This, together with the demographics data showing that the learner population is significantly divided between those who frequently use their devices to watch games and those who do not watch at all, indicates a significant divide in learner experience; learners either have considerable experience with watching games or little to none, as is the case with playing games.

For Preference for Watching, the group mean was 2.30, but learners rated their enthusiasm for learning English this way (Question Item 34) at only 1.85. Nevertheless, when isolating learners between those who neither play games nor watch gameplay from those who play games, watch gameplay, or both, the results differ between being considered *disagree or low* (2.05) and *agree or moderate* (2.53), respectively. Several of the written comments also showed a preference for watching gameplay. One learner explained, "I often watch Vtubers. There are some Vtubers who speak English. I often think I want to understand what they are talking about. I also think it is good for English studying." Others wrote comments such as, "I think it is a good way," "It sounds fun," and "I want to know how I can improve my English by watching gameplay." Others specified positive preferences due to the ability to have fun while learning by writing, "I think it is good because I can learn while having fun," and, "I think it is very good. If you can learn by what you like, then it is the best way." Multiple other comments also voiced this opinion. There was also a sentiment that it is primarily favorable for people interested in games. "If games are your hobby, then I think you can learn with fun," one learner wrote. Another mimicked, "I think it is good since you learn things well if you like it."

Learners also rated Ease of Use (group M=2.67) as moderate, and this increased for those who watch gameplay (group M=2.93) compared to those who do not (group M=2.43). This may provide evidence of the accessibility of watching gameplay. Yet there may be several potential explanations for this. Students who engage in watching gameplay may realize its ease for independent language study. But the students predisposed to enjoying watching gameplay may also find it easy to study this way. These differences cannot be distinguished based on the current data. Nevertheless, it is promising that even the learners who do not currently engage in the activity still felt to a moderate degree that it would be easy to learn this way, albeit to a lesser extent.

Finally, Learning Opportunities was also rated as moderate (group M=2.58), and this again increased for learners who watch gameplay and lowered for

those who do not. Yet, through the written comments, two caveats were identified. First, multiple comments were made regarding the concern of the English being too difficult to comprehend and the need for scaffolding assistance, subtitles in particular. A learner explained, "I think if there are subtitles, then it would be easy to watch, fun, and educational, but without subtitles, I think there are some difficult parts in studying." And another reiterated, "Since there are no subtitles for the script, I think it would be very difficult without studying a certain degree before watching them." Thus, having subtitles and pause/rewind features offered with prerecorded content may be suitable. Further studies can ascertain students' preferences and the comparative benefits in this regard.

Secondly, multiple comments were made regarding perceived limitations with the used language. "When listening to gameplay in English, I am wondering if there are any vocabulary limitations," one commented. Others specified, "...in live games, the spoken content is limited, so it is doubtful how much it can be used in daily conversation," "I think the English would be a little specific, but I think it is good," and, "I think it's good to watch gameplay to learn English. However, you should be careful not to type WTF or LOL on a daily basis." In summation, learners felt that there are adequate learning opportunities, but the perceived level of difficulty is higher than their personally assessed proficiency, warranting a desire for additional assistance. Additionally, the types of words learned may not be desirable or practical.

Overall, Preference, Ease of Use, and Learning Opportunities are all significantly higher for learners who play games or watch gameplay. One explanation may be that learners exposed to games realize their language-learning potential, which is favorable when addressing learner adoption. Yet, this can also indicate that learners who already favor games are predisposed to be motivated to learn through them and think they are linguistically beneficial. Future qualitative research can address this distinction further.

Conclusion

Watching gameplay is a rapidly growing phenomenon that plays a vital role in students' lives, drawing research interest from various fields. Nevertheless, it has yet to be considered for language learning purposes. Whenever assessing the merit of a new technology or approach to language learning, it is necessary to both test the implementation feasibility from a practical standpoint as well as discuss the linguistic effectiveness. This study has sought to introduce the necessity of both while offering a first step in collecting data on the former and giving direction to the latter for further studies. By collecting and analyzing data on learners' habits and perceptions, evidence for feasible applications has been postulated. The findings indicate several potential advantages of learning English through watching gameplay while also revealing some hesitancies that students had regarding the difficulty and effectiveness of the used language.

While most DGBLL studies focus on serious games, the majority of watching gameplay involves COTS games. The results of this study showed that most

students play games on either a cellphone or gaming console and rarely use PCs for this purpose. This, therefore, may limit many PC-exclusive COTS games with higher-end, expensive system requirements. Conversely, watching gameplay may alleviate such barriers, potentially allowing feasibility for learning applications. Overall, the participants in this study expressed positive attitudes and perceptions of language learning.

Opportunities for future research include further testing students' attitudes and perceptions with larger and more diverse samle sizes and improving the questionnaire accuracy by testing, verifying, and strengthening the question items. Additionally, further research could benefit from a more thorough analysis of students' individual preferences through qualitative methods such as interviews. Next, researchers can explore students' motivation or reluctance to participate in live chat conversations, reasons for watching in L2 languages, and the potential implications of watching live or prerecorded content. Finally, as stakeholders include both learners and educators, future studies can focus on educators' attitudes and perceptions as well.

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Appendix A

Participants' comments and categories

Generally good

"I think it is a good way."

"It would be good to learn English using any method."

"I think it is very useful for things like listening."

"I want to know how I can improve my English by watching gameplay."

"I think it's good for Japanese people to learn English."

"I think it would be very fun."

"I think it is very good."

"I often watch Vtubers. There are some Vtubers who speak English. I often think I want to understand what they are talking about. I also think it is good for English studying."

"It sounds fun!!"

"Interesting."

"I think it's good to watch gameplay to learn English. However, you should be careful not to type WTF or LOL on a daily basis."

Can learn English while having fun

"I think it is good because I can learn while having fun."

"I think it is very good. If you can learn by what you like, then it is the best way."

"I think it is good since you learn things well if you like it."

"I think it's a good idea because you can do it while having fun."

"I think it's easy to get interested in English if you can work on English from something that seems interesting to you."

Can learn effectively and learn natural English

"I don't watch gameplay in English, but I often watch reaction movies of anime in English, so I think it is very good since I can learn native speakers' pronunciation and intonation naturally."

"I think it is a good way to memorize detailed vocabulary."

"I think it is effective if it is an area of interest."

"I think it is good because you can listen to natural English."

"It seems like I can learn quick and natural English."

"I think it's good because you can enjoy watching because the words that you know are heard often."

Good for people interested in games

"I think it is a good way for people who like games."

"If games are your hobby, then I think you can learn with fun."

"I think for games that you are interested in, you would actively work on it."

"If you like games, it would be nice to have fun while studying."

"If it's a genre you're interested in, you'll be willing to watch it."

Effective, especially if subtitles or other assistance is available

"For watching gameplay in English, they speak fast, so it is easier to watch if they have subtitles."

"It would be easy to understand if there are subtitles, but basically, native speakers speak fast and use slang, and I often don't understand."

"Since there are no subtitles for the script, I think it would be very difficult without studying a certain degree before watching them."

"I think if there are subtitles, then it would be easy to watch, fun, and educational, but without subtitles, I think there are some difficult parts in studying."

"I think it is good because the hurdles for studying English will be lowered."

The used language might have limitations or might not be desirable, practical, or easily understood

"Since it is not a daily thing, I don't think it is desirable."

"When listening to gameplay in English, I am wondering if there are any vocabulary limitations."

"It may be difficult to understand because the commentator is so absorbed in the game that he has a lot of casual expressions."

"It is difficult to understand the content unless you know the words specific to the game."

"I think it is a very good thing to do it. But I don't really think you can learn daily conversation by watching gameplay."

"I think the English would be a little specific, but I think it is good."

"I think it's easier to listen to because there are more words that I know than usual. However, in live games, the spoken content is limited, so it is doubtful how much it can be used in daily conversation."

Appendix B

Motivation and current effort to learn English (individual items)

Item (individual)	M	SD
1. I am putting effort into studying English.	2.74	0.64
2. I think I'm doing my best to learn English.	2.65	0.72
3. I want to spend a lot of time studying English.	3.02	0.67
4. I'm more focused on studying English than my classmates.	2.25	0.70
5. I want to study English even if it's not required.	3.14	0.70
6. I think learning English is very interesting.	2.86	0.77
7. I'm always looking forward to my English classes.	2.65	0.69
8. I want to take more English classes.	2.51	0.77
9. I want to have the opportunity to learn English outside of the classroom.	2.95	0.78
10. I'm excited when I hear English spoken.	2.64	0.86
11. I'm interested in how English is used in conversation.	3.12	0.67
12. The differences between Japanese and English Vocabulary are interesting.	2.86	0.88
13. I like the rhythm of English.	2.88	0.81

*Scale ranges from 1 (strongly disagree) to 4 (strongly agree).

Appendix C

Technology acceptance questions (individual items)

Ease of use

Item (individual)	M	SD
Watching others play digital games in English would...		
14. ... improve my English learning performance.	2.66	0.75
15. ... increase my English learning productivity.	2.59	0.75
16. ... enhance my English learning effectiveness.	2.68	0.74
17. ... help me achieve better grades in my English classes.	2.27	0.69
23. I would know how to handle watching others play digital games.	3.07	1.02
24. It would be easy for me to watch others play digital games in English to learn English.	2.74	0.98

Learning opportunities

Item (individual)	M	SD
Watching others play digital games in English ...		
18. ... offers opportunities to experiment with English knowledge.	2.75	0.73
19. ... offers opportunities to take control over the English learning process.	2.55	0.73
20. ... offers opportunities to experience things you learn about.	2.77	0.73
21. ... offers opportunities to interact with other students.	2.63	0.80
22. ... offers opportunities to think critically.	2.13	0.72
25. ... offers opportunities to motivate students to learn English.	2.69	0.85
26. ... is more effective for learning English than playing games myself.	2.51	0.90

Experience with watching

Item (individual)	M	SD
27. I like watching others play digital games in English.	2.01	0.87
28. I often watch others play digital games in English.	1.68	0.84
29. Compared with others my age, I watch people play a lot of digital games in English.	2.04	1.06
30. I would describe myself as a gamer.	2.02	1.08
31. I watch people play different types of digital games.	2.19	1.17

Preference for watching gameplay to learn English

Item (individual)	M	SD
32. If I had a choice, I would choose to learn English by watching people play digital games in English.	2.20	0.88
33. I would be in favor of watching people play digital games in English to learn English.	2.83	0.81
34. I am enthusiastic about watching people play digital games in English to learn English.	1.85	0.78

*Scale ranges from 1 (strongly disagree) to 4 (strongly agree).