Invited Article

GAMES AND LANGUAGE LEARNING: AN INTERNATIONAL PERSPECTIVE

Aaron Chia Yuan Hung*
Adelphi University

Jonathan deHaan
University of Shizuoka

To-Ken Lee
Huafan University

Gee (2003) has posited that successful digital games embody design principles that are based on an understanding of how people learn. Games have been used for language learning for decades, and the growing popularity of digital games, coupled with improvements in hardware and software, have made them common tools in second language acquisition classrooms. Empirical research, however, on games and language learning is still relatively scarce. In this paper, we explore the existing evidence on how digital games can be and have been used in language learning, with particular focus on studies that originate from outside the United States. The paper examines three categories of studies that focus on different aspects of gameplay: in game-player interactions, in player-player interactions, and in game-player–online community interactions. Our paper critically presents how using games can be oversimplified in their application and offers ways that the implementation of games and game-like activities can be improved.

Keywords: analog games, digital games, EFL, game-based learning, language learning

Although games have been used in education for decades, Gee's (2003) *What Video Games Have to Teach Us About Learning and Literacy* reinvigorated interest among educational researchers by drawing on different disciplines and showing how game designers have inadvertently—and successfully—applied design principles uncovered in the learning sciences to games that are played around the world by individuals of all ages. Coming from a respected scholar, Gee's book served as a research agenda—though the book itself relies mostly on personal anecdotes—for scholars to show whether and how games are effective tools for learning. Fifteen years later, empirical evidence is still mixed, in part because a lot depends on *how* games are used and whether the focus is on the game, the player, or the community.

This article briefly explores these three kinds of studies as they relate to games and language learning. Game-player interactions concentrate on how particular games can be used for language learning; these studies tend to select games that are perceived to have qualities or affordances that support language learning. Player-player interactions examine how people communicate and/or collaborate in the game; most of these involve multiplayer games, where players may be sharing the same physical space or be geographically dispersed. Finally, player-online-community interactions look at the communities that emerge around games; in these studies, people are drawn together not by friendship but by shared

interest (Ito et al., 2010) and, together, are able to produce a range of texts that support language learning (Black, 2008; Lam, 2000). We have focused on the international context because the lack of authentic English input in those cultures has often led to more creative use of games in the classroom.

Game-Player Interactions

The use of commercial digital games in the classroom poses a range of benefits and drawbacks. Commercial games are readily available and usually incorporate some of the learning principles Gee (2003) mentioned. Unlike "edutainment" games, which often resort to drill-and-practice activities inserted into game-like structures (Squire, 2006), commercial games are designed to keep players' interest while putting them in progressively challenging situations. However, because educators and game designers often do not share the same learning goals, the control of how learning shifts to the game designer, unless the educator can reappropriate the game for a different purpose.

A straightforward way is to use a game as the focus of the lesson, such as exposing students to new vocabulary. deHaan, Reed, and Kuwada (2010) used the music video game *Parappa the Rapper 2* with Japanese undergraduate students to study the effects of interactivity on vocabulary recall. Participants of equivalent game and language proficiencies were randomly paired up, with one person playing the game while another watched. The goal of the game is to press the right controller button at the right time as the button icon scrolls across the screen. At the same time, the song lyrics are displayed at the bottom of the screen. When the correct button is pressed, players see an increase in their score as well as an animation and a sound effect. Both participants were then presented with a list of words taken from the lyrics to see whether they are able to recall them after the game. Although their results show that video games can be a source of linguistic input, the interactivity of the multimedia learning environment actually hindered language acquisition. This is consistent with Mayer's (2009) notion of cognitive load, which argues that there is a limit to the amount of visual and auditory input people can process at the same time. deHaan et al.'s (2010) study shows that watchers, who were not encumbered with having to interact with the game, were able to focus more on the game and its language.

Even though English was a significant part of the music game, it did not require the participants to recognize any of the words in order to play. In Lee's (2014) study of Taiwanese students interacting with a negotiation game, English took on a more central role. The game itself is simple, consisting of still images and multiple choices, providing users with a low-stakes but authentic scenario in which the players have to understand and respond to the correct negotiation tactic. In this case, the lack of multimedia interactivity may be more conducive to language learning because it gave students additional time to process the language. Together with deHaan et al.'s (2010) study, this research suggests that interactivity may hinder learning unless educators and students can have more control over when and how linguistic input is presented.

Coleman (2002) transformed a game out of its original context entirely. He used *SimCopter*—a simulation that allows players to navigate a virtual city either by helicopter or on foot—as part of an ESL writing assignment that focused on audience perspective. In the activity, students were asked to navigate the helicopter to plan a route that someone walking on foot would have to follow; the students were assigned to groups and had to take notes and collaborate before they wrote the instructions. This task was followed by having students use the written instructions themselves to navigate the city and reflect on whether they successfully took the point of view of another reader. Because the helicopter has a bird's eye view while the pedestrian's is far more limited, this task was harder than expected, and students were surprised at how often they were unable—literally—to anticipate another view.

Player-Player Interactions

A significant body of research has emerged on the importance of communication among game players (Chen, 2012; Hung, 2016; Piirainen-Marsh, 2012; Sierra, 2016; Steinkuehler, 2004; Stevens, Satwicz, & McCarthy, 2008). While games can be resources for authentic language input, they can also be the catalyst for authentic language use between players. Here, although the game remains important, the focus shifts from the game to the relationship between players as mediated by the gaming context.

Players often find ways to demonstrate their competence not only of the game but also of their understanding of the game's world, language, and characters. For example, Piirainen-Marsh and Tainio (2009) used conversation analysis to study a pair of 13-year-old Finnish boys playing *Final Fantasy X*, a role-playing game with a complex narrative and cast of characters. The game served as a platform on which the players could interact, often through repetition and reproduction. The authors assert that "By producing lexically, grammatically, and prosodically matching utterances prior to their production in the game, participants display detailed knowledge not only of linguistic units but also of the subtle implications that utterances carry in their contexts of use and their potential for shaping interpretations of the narrative, its events, scenes, and characters" (p. 162). They further note that, although the players are repeating linguistic input from the game, they are doing so to demonstrate their competence to one another as a form of collaborative play.

Zheng, Young, Brewer, and Wagner (2009) examined native and non-native English speakers interacting through *Quest Atlantis* (*QA*), a virtual environment designed with education in mind. They compared two groups of seventh-grade students in mainland China: one group spent study-hall time studying tests while the other group interacted asynchronously with native English speakers from Australia and Singapore. The study yielded mixed but interesting findings. The students who used *QA* scored slightly lower essay scores, likely because the time spent in the game was not conducive to essay-writing; they developed, however, a more positive attitude toward English language learning, showed more creative uses of English language use, and gained more cultural awareness through co-questing with non-native English speakers. Likewise, Peterson's (2011) study of Japanese ESL students playing in the massively multiplayer online game *Allods Online* shows them using positive strategies to signal interest and build positive relationships with fellow players.

Coleman's (2002) use of a flight simulator to teach an important aspect of academic writing clearly illustrated the effect that teaching can have on game-player interactions. Coleman (2002, p. 220) cites Jones' (1986) statement—"It's not so much the program, more what you do with it"—for his own purposeful modification and appropriation of games for carefully chosen educational goals. Experimental studies have also explored the effect that teaching materials can have on player-player interactions around games. Miller and Hegelheimer (2006) and Ranalli (2008) tested student groups (dyads and triads) for their ability to recall vocabulary after either playing games (*The Sims*) or after playing games and using supplemental worksheets designed to promote noticing and retaining vocabulary from the games. In both studies, students who used the additional materials recalled more vocabulary than did students who lacked to those materials. *How* teachers use games does matter, and future pedagogically oriented research and the sharing of these teaching and learning resources are important components in any agenda for the study of game-based teaching and learning.

Game-Player–Online-Community Interactions

Games can be a source of inspiration for a host of online communities. Ito et al. (2010) referred to these activities as interest-driven participation, where people get together because of a shared interest instead of a prior friendship. Black (2008) described this in her work on online fan fiction, in which she documented how English language learners (ELLs) wrote and shared their fan fiction—anime, manga,

video games, TV shows, and other media—in English with an authentic audience (i.e., an audience that isn't their teacher), who provided support and critiques to further improve their writing.

deHaan (2011) combined project-based learning and video games with Japanese ELLs. In one activity, students were asked to create their own role-playing game using *RPG Maker VX,* which is modeled after *Final Fantasy X*. The students started by providing a summary in English of *Final Fantasy X* and using it as the basis for their own game; they then put together an interactive story and looked up scripts of other games that matched the types of game they wanted to design. This activity gave deHaan a way to talk meaningfully about story genres, English dialects, and dialogue; he also had students design an online English gaming magazine, which afforded them the opportunity to develop reading, writing, listening, and speaking skills as well as technology skills such as digital publishing.

In another project, deHaan (2013) and his students organized two six-day camps for Japanese high school students interested in language learning and games. The students engaged in a variety of activities—game-player explorations of various video game genres in order to learn vocabulary, player-player interactions in other games, and designing and developing a online adventure game and a related advertisement and mock game industry event interview about their game. One of the most memorable experiences for the students in the camp, however, was the brief game-player–online-community interactions they had on the adventure game's community site. The camp was held about two months after the 2011 earthquake and tsunami in Japan. Soon after the teams posted their games and introductory information to the community site, community members from all over the world sent messages asking if the students had been affected, if they were safe, and offering to help them learn more about the game design tools. The high school students were not only moved by the engagement and generosity of the community, but also enjoyed working together to post appropriate English responses to the queries. Connecting classroom-based work to an online community can create an authentic purpose for game play and design and offer unexpected additional communication and learning opportunities.

Discussion

The studies above provide a sampling of empirical research that investigates the potential of digital games for language learning, with a focus on how researchers, educators, and students in different parts of the world use games as a way to develop language skills. In this section, we indicate some important themes to take away from these studies and discuss implications for further research.

Although Gee (2003) outlines a compelling set of learning principles used in video games, we should not assume that video games can effectively be used in the classroom without significant modification. First, the design and structure of digital games do not easily fit into the organization of the school or work well as a learning resource. For example, Zheng et al.'s (2009) research suggests that there may be a gap between how learning is assessed in school and how it is used in a virtual world, even if the virtual world provides opportunities to interact with native English speakers. This gap is not unique to games and language learning, and has been discussed in other domains (Lave, 1988). Such a gap may encourage formal assessments to be more authentic and practical, but until they do make that change, it remains a challenge for digital games to be adapted for the classroom. Likewise, research by deHaan et al. (2010) shows that games may overload players' cognitive processes, making them less effective as learning resources. Instead, these authors, as well as Miller and Hegelheimer (2006) and Ranalli (2008), suggest creating scaffolds and note-taking activities that give students time to reflect on and discuss the language of the game in a more deliberate manner.

A related concern is whether digital games are an effective use of time, even if they do yield some positive results. Most commercial games take over dozens of hours to play, and even more to master. Furthermore, while games may embody effective learning principles, players still have to agree to play

them and be comfortable doing so. Reinhardt, Warner, and Lange (2014) documented the tension that several students experienced when using games to learn German; while some students were enthusiastic about using games to acquire and practice their L2, other students did not engage in the playful learning activities to the same degree. In other words, there may be a degree of selection bias when considering the popularity of digital games that is understated when educators ponder a game's potential as a learning tool and assume that its commercial success will transfer to the classroom (Arnseth, 2006; Hung, 2011). Finally, to provide adequate scaffolds, guides, and support for students, educators will need to be familiar with the game itself and know what kinds of supports to offer and when to offer them, including support to properly participate and for new vocabulary, new game concepts/mechanics, and new topics. Educators may also have to create additional content, as Coleman (2002) did, if they want to reappropriate the game for a different purpose.

There are two main ways to overcome these challenges. First, games may be offered as a kind of flipped classroom, where students can play the game outside of class and then spend class time going over relevant language topics or activities, as discussed in deHaan (2011). This would also allow students more choice to play the kinds of games they would like to play, without turning an otherwise volunteer leisure activity into a mandatory classroom activity. Depending on their age, they can be encouraged to play in groups or even with players from other countries, thus exposing them to more diverse cultural backgrounds. Educators may still consider offering ways for non-gamers or novice gamers to participate in order to avoid alienating those who are not interested in digital games and prefer to learn in other ways. A useful pedagogical framework for this last approach is Thorne and Reinhardt's "Bridging Activities" model (2008), in which learners find and bring in texts to the classroom to analyze with other learners and the teacher, and then use that awareness-building work to, in turn, create their own texts—for example, games or communication around games—for online communities. This model would work for students interested in a variety of hobbies and texts, not just games, which would be another way for a teacher to allow students to work with the language, technologies, and communities they are most interested in.

Another possibility is to use analog games, such as board games, instead of digital games. Analog games have been used for language learning for many decades (Oxford & Crookall, 1990). Although board games are usually smaller and less visible than digital games in the public consciousness, designers and players of board games remain a vibrant community that puts out well-designed games that are often better suited for classrooms. Games like *Pandemic*—a board game about preventing the spread of deadly, contagious disease—offer opportunities for players to cooperate and pick up content-specific vocabulary (Masuda & deHaan, 2015). Board games are easier to fit into the class schedule and generally require less time to complete. They are also comparatively cheaper to use, as they do not need hardware or network connections. Websites such as boardgamegeek.com showcase a variety of board games on a range of topics and skills, for any age level that educators may consider if they wish to find games that work better in a formal classroom setting. York, deHaan, and Hourdequin (accepted for publication) explore combinations of tabletop game genres (cooperative, hidden role, strategy, and party games), instructional contexts (requisite class, extracurricular project, and self-access center work) and pedagogical frameworks (task-based language teaching, multiliteracies pedagogy, and cultural-historical activity theory), and offer implications related to teachers' game literacy, student agency, and curricular and pedagogical connections.

Ideas for Game Designers

We are happy to find that there is much game designers themselves can do to create games that encourage language learning. Game designers often put in great effort to design environments that reflect how the real world works—how different materials interact, how objects are lighted, how debris is scattered, and so on. The Japanese vacation simulation game series Boku no Natsuyasumi (My Summer Vacation) lets players experience a holiday from the perspective of an elementary school student staying with relatives on a farm or at the beach. The games are set in the 1970s. Though the games are made for a Japanese audience, Japanese language students can use the games' dialogues (and subtitles) to learn Japanese and can explore the culture and history in the game. The Shenmue and Yakuza games, though not as family-friendly as the My Summer Vacation games, let players experience home and city life in more modern times in Japan. Many recent games have paid attention to realism in human behavior, including such minute details as having characters appear restless when they stay in the same position for too long or having characters squint and shield their eyes if a torch is shone on them. Other games, such as *L.A. Noire*, have attempted to simulate realistic dialogue, giving players a range of conversation options and potentially branching consequences, or making facial expressions a central game mechanic that players have to use to detect another character's motivation and trustworthiness. While games are seldom designed with education in mind, some designers put in an extra step to give their game a potentially educational use. For example, *Assassin's Creed: Origins*, an alternate-history game set in ancient Egypt, comes with an education mode that features 75 interactive tours players can take to learn more about Egyptian history while immersed in the beautifully rendered world that was designed for the game. Although these attempts to encode complex human behavior is rudimentary and sometimes crude, realism is clearly something many game designers strive for. Why not have language learning be part of it, either as a central element of the game or as a potential source of collateral (incidental) learning (Becker, 2011)?

Many narrative games already support closed captioning and/or are localized for audiences in different countries. Since the real world is filled with circumstances where we have to interact with someone who speaks a different language, game designers can build in situations that require players to communicate with another character who speaks a different language in order to proceed. Alternately, more games can build in education modes, such as in *Assassin's Creed: Origins*, so that the formal learning does not interfere with the play itself but still allows players to explore on their own, perhaps even incorporating what they learned back into their play experience.

For more formal attempts to design language-learning video games, Purushotma, Thorne, and Wheatley (2009) offer their own set of design principles, which intersect with second language acquisition theory, multimedia theory, and the learning sciences. For example, they argue that games designed around grammatical forms end up being boring. Instead, and drawing on Ellis (2005), they suggest that games should focus first on meaning, then on form, so as to create a more meaningful and engaging learning experience. They also encourage games to be designed around tasks instead of traditional curricular topics and sequence, such as colors. For example, instead of introducing colors as their own category, students might begin with learning only the color red in their first mission as they complete a task that requires them to know the vocabulary. This would not only make it easier for students to recall the vocabulary but it would also make the game itself more coherent.

Conclusion

Educational technologies are prone to being aggressively hyped as learning tools (Selwyn, 2014), and digital games are no exception. Their success in the commercial market can seem alluring to educators who want to improve students' interest and engagement in the classroom. While we agree with Gee's (2003) analysis of the learning principles present in well-designed games, we have argued that using games for language learning may face various challenges in formal learning. In our review, we have provided examples of empirical research that has seriously investigated the potential of games for language learning. Although games are a rich source of authentic linguistic input, their use has to be scaffolded and planned carefully to meet student needs.

This renewed interest in games and learning has invited new avenues of research and innovation. With augmented reality and virtual reality on the cusp of becoming mainstream educational tools, we anticipate another wave of optimism and invention that may benefit students of the future. Further empirical research, especially qualitative research, is crucial in helping us better understand how players interact with games (Arnseth, 2006). Closer collaboration between educators and game designers would also help bridge any gaps between how games are intended to work as a leisure-time activity and how they may function as a formal learning tool.

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*Corresponding author: hung@adelphi.edu