Chapter IX
Amusing Minds for Joyful Learning through E-Gaming

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ABSTRACT

The purpose of this chapter is to investigate the present use of e-gaming in language acquisition along with its potential and challenges. We review the use of traditional, non-electronic games for language acquisition, provide a brief introduction of computer-assisted language learning (CALL), and examine the use of electronic games in language learning. Although there is limited research on the use of electronic games in language acquisition, potential exists for the integration of electronic games in language classrooms. In addition, more in-depth research is still needed in this field. For classroom practice, we provide a resource of online e-games for practitioners.

INTRODUCTION

It is increasingly common to see young people spending time playing video games. Several researchers (Funk, Hagen, & Schimming, 1999; Squire, 2006; Williams, 2003) have noted that many youth today spend more time playing video games than reading, or watching TV or films. Thibodeaux's study in 2001 showed that nearly 84% of children between the ages of 12 to 17 had a video game console, and 38% of them played video games for at least an hour every week (as cited in Jenkins, 2005, p. 48). The Kaiser Family Foundation reported in 2003 that 50% of U.S.

children have played computer games by the time they are six years old (as cited in Jenkins, 2005, p. 48). Similar findings were reported in Jones's survey of students at more than 20 U.S. colleges and universities in 2003, which indicated that all students had played a video, computer, or online game (collectively, electronic games) and that 65% of the students identified themselves as "regular or occasional" game players (as cited in Jenkins, 2005, p. 48). Facing students' strong interests in and even addiction to these electronic games, many educators seek to understand games' attractiveness. Many wonder if there are attributes of games that are beneficial to learning and consider ways in which games could be used for learning. Some scholars have challenged the traditional view that "games, as opposed to work, are unproductive and non-utilitarian" (Ang & Zaphiris, 2007, p. 448) and have attempted to explore the potential of games in education. For example, Gee (2005) maintains that good games incorporate learning principles supported by current research in cognitive science.

With the rising interest in using electronic games in education, electronic games may also have potential to impact the field of second language acquisition. In this chapter, we first elaborate on research using traditional (non-electronic) games in language acquisition. Next, we identify key findings from existing research in the intersection of electronic gaming and language acquisition. Finally, we explore implications for future research, policy, and practice.

BACKGROUND

Traditional (Non-Electronic) Games in Language Learning

Reviewing non-electronic game use in language classrooms sheds light on further exploration of e-gaming (electronic gaming) in language teaching.[1] The use of simulations and games in

language acquisition has been valued by many practitioners and researchers (García-Carbonell, Rising, & Montero, 2001; Gaudart, 1999; Halleck, 2002; Hill, 2002; Kovalik & Kovalik, 2002; Macedonia, 2005; Jung & Levitin, 2002; Saliés, 2002). Language classrooms often integrate role-playing simulations or card and board games for language instruction. Cekaite and Aronsson (2005) studied the role of play in children's second language acquisition and emphasized the need to incorporate language play into learning. According to Crookall and Oxford (1990), gaming techniques are very powerful means of helping people to acquire certain foreign or second language skills. Previous research on the use of simulations and games in language classrooms has illustrated the impact of their use to teach speaking (Macedonia, 2005), writing (Kovalik & Kovalik, 2002; Saliés, 2002; Spelman, 2002), and enhance cross-cultural understanding (Jung & Levitin, 2002) and communicative competence (García-Carbonell et al., 2001). Based on the previous research, two significant strengths of using simulations and games in language learning are presented below.

Motivation and Traditional Games

Using simulations in language classrooms promotes positive affective factors such as increased motivation and engagement. Reflecting on using simulations and games in an English for Academic Purpose (EAP) class, Saliés (2002) maintains that students were highly motivated when involved in simulations and games, and had positive attitudes towards learning. Furthermore, simulations involve students, even those who are normally quiet, in active participation (Saliés, 2002). Macedonia (2005) states that language games are used to practice or strengthen declarative knowledge with entertainment as a positive side effect based on her experience with using wooden blocks, cards, and finger games in teaching Italian as a foreign language to German-speaking learners. She

emphasizes that language games provide opportunities of "redundant oral repetition of grammar structures" (p. 139), yet in a playful way. From a neurological perspective, Macedonia (2005) stresses the important role of positive emotions in game-based language learning, which can enhance students' fundamental motivation.

Traditional Simulations

Simulation is commonly used in language learning. Simulation provides real-world and life-like language learning opportunities and a culturally immersive learning environment to language learners.

Real-World and Life-Like Experience

Real-world communication and life-like interactions are created in simulations to engage students in participation and therefore encourage "declassrooming the classroom" (García-Carbonell et al., 2001, p. 485) by promoting a student-centered classroom over a teacher-centered classroom (Saliés, 2002; García-Carbonell et al., 2001). Gaudart (1999) believes that one major advantage of using simulations and games in language classrooms is to alter teacher-centered classrooms by providing students with opportunities to fully use the language: "With practice comes progress, with progress comes motivation, and with motivation comes more learning" (Gaudart, 1999, p. 290).

Learning Environment

Jung and Levitin (2002) report using a courtroom simulation in an ESL (English as a Second Language) class for Southeast Asian government officials. They find simulations can offer real-life cultural and linguistic environments for language students. In Halleck's words, the courtroom simulation used in Jung and Levitin's classroom can "provide a bridge to another world—not only

that of courtroom but that of spontaneous communication in a formal setting and in a foreign language" (2002, Halleck, p. 278). However, Jung and Levitin (2002) point out that not all students may perceive the value of the simulations. Some students may think simulations are "time consuming and not serious" (p. 372). Hill (2002) contends that simulations may not address all learning styles. Also, unequal participation may be bothersome for some students.

CALL: Computer-Assisted Language Learning

In a rapidly developing information age, "technology" has become a buzzword in education. The language teaching field is no exception. Computer-assisted language learning (CALL) has moved into the mainstream since the term *CALL* was first used in 1983 at the TESOL Convention in Toronto, Canada (Chapelle, 2005). With the advent of computers and the Internet, language education has taken great advantage of technology. To date, a bulk of research has been conducted on the use of computers and the Internet in teaching and learning foreign languages or second languages. Today, e-gaming is becoming valued by some educators and researchers, and e-gaming in language learning is also drawing research attention. Undoubtedly, e-gaming will be a topic with great opportunities and challenges.

Warschauer (2004) predicts the effect of technology changes on English teaching in five areas: new contexts, new literacies, new genres, new identities, and new pedagogies. The structure of predicting future CALL used by Warschauer provides the lens through which e-gaming in language learning can be viewed. We borrow the concept of the five areas to interpret e-gaming as a trend in CALL. First, e-gaming is definitely a new genre in new contexts, in which technology does not remain just a tool but also becomes the content in language classrooms. That is, e-games

are not only a vehicle loaded with textual and auditory information, they also provide cultural elements as course content (Cruz, 2007). Second, language learners playing e-games are engaged in new literacies since e-gaming is a new and fast-developing genre in media literacy. Third, language learners are invited to develop new identities in game communities, especially in massively multiplayer online games (MMOGs). Last, with regards to e-gaming in the classroom, new pedagogies are necessary to help language learners use e-games for the purpose of academic learning.

E-Gaming in Education

With the development of gaming technologies, the integration of gaming with learning has become a popular topic in the field of education. Extensive and varied research has been conducted on e-gaming in education as a whole (Garris, Ahlers, & Driskell, 2002; Margolis, Nussbaum, Rodriguez, & Rosas, 2006; Rosas et al., 2003; Shaffer, Squire, Halverson, & Gee, 2004; Squire, 2006). Considerable research has demonstrated that e-gaming has tremendous positive influences on learning experiences (Garris et al., 2002; Shaffer et al., 2004).

Previous research demonstrates that e-games enhance computer literacy (Benedict, 1990), attention (Bavelier & Green, 2003), reaction time (Orosy-Fildes & Allan, 1989), and promote problem-solving skills (Gee, 2003; Johnson, 2005). Additionally, e-games can be "very useful in acquiring practical skills, as well as increasing perception and stimulation and developing skills in problem-solving, strategy assessment, media and tools organization and obtaining intelligent answers" (de Aguilera & Mendiz, 2003, p. 11). Often, there are many effective learning principles integrated into good game design (Gee, 2004, 2005).

E-GAMING AND LANGUAGE LEARNING

Research on E-Gaming in Language Acquisition

Weighed against the considerable body of published work on e-gaming in education in general, only a limited volume of literature specifically addresses e-gaming in language acquisition. Most studies on e-gaming in language acquisition analyze the features of e-games that have potential for language learning. A few researchers have focused on the learner's use of e-games in language acquisition (deHaan, 2005; Herselman & Technikon, 2000; Yip & Kwan, 2006). In addition, there are several studies on game design tools and principles related to language acquisition (Morton & Jack, 2005; Pasero & Sabatier, 1998; Johnson, Vilhjalmsson, & Marsella, 2005). Ang and Zaphiris (2007) identify two perspectives on the use of games in language learning: games as virtual environments and games as collaborative learning. Table 1 presents a summary of the current literature on e-gaming in language teaching and learning.

As shown in Table 1, most of the literature was published in the last two years, which implies the research on e-gaming in language acquisition is still a newly emerging topic. Next, we analyze the present research on e-gaming in language acquisition in terms of second language acquisition theories, e-games in language learning, classroom instruction related to e-games, and e-game design tools.

Second Language Acquisition Theories Related to E-Gaming

There are several language acquisition theories that relate to a discussion of e-gaming and language learning. Krashen's Comprehensible Input Hypothesis can be applied to elaborate on the

Table 1. Summary of research on e-gaming in language learning

Topic	Authors	Year	Title	Research Focus
Game **Design**	Hansson	2005	English as a Second Language on a virtual platform—tradition and innovation in a new medium	Virtual didactic; virtual avatars
	Johnson et al.	2005	Serious games for language learning: How much game, how much AI?	Computer games; serious games; game design techniques; design principles; Artificial Intelligence (AI)
	Morton & Jack	2005	Scenario-based spoken interaction with virtual agents	Spoken Electronic Language Learning (SPELL); virtual agents
	Pasero & Sabatier	1998	Linguistic games for language learning: A special use of ILLICO library	Linguistic games; design principles; ILLICO (a tool box for natural language processing, i.e., NLP)
Gaming **&** **Learning**	Ang , Zaphiris, & Wilson	2005	Social interaction in game communities and second language learning	Models of social interaction in computer game communities; language learning opportunities in the in-game and out-of-game community
	Ang & Zaphiris	2007	Computer games and language learning	Computer games; theoretical issues; CALL; case studies
	Cruz	2007	Video games and the ESL classroom	Integrate video games into ESL curriculum; teaching activities
	deHaan	2003	Learning language through video games: a theoretical framework, an evaluation of genres and question for future research	Video games; genres; framework
	deHaan	2005	Acquisition of Japanese as a foreign language through a baseball video game	Video games; foreign language; case study
	Herselman & Technikon	2000	University students benefiting from the medium of computer games: a case study	Computer games; drill and practice games; case study
	Purushotma	2005	Commentary: You're not studying, you're just…	Massively multiplayer online games (MMOGs)
	Yip & Kwan	2006	Online vocabulary games as a tool for teaching and learning English vocabulary	Online games; vocabulary learning; quasi-experimental study

concept that exposure to language is optimized in simulations and gaming (García-Carbonell et al., 2001). Also, according to Krashen's Affective Filter Hypothesis, a lower affective filter facilitates language learning, which is one of the positive qualities of simulation and gaming in second language acquisition (García-Carbonell et al., 2001). Furthermore, Cummins' Four Quadrants provides implications for language teachers to integrate e-games in teaching and learning (Cummins, 1981).

Comprehensible Input

The Comprehensible Input Hypothesis proposed by Krashen (1981) contends that in order for language acquisition to occur, the language input should be comprehensible to language learners in many forms, such as visual aids, adapted texts, and the use of less complex language. In other words, language learners "understand messages with 'unacquired' grammar with the help of context" (Zainuddin & Yahya, 2006, p. 148). Language learners make progress when they are exposed to the language input (i) one step beyond their current level of proficiency (i+1). In e-gaming, visuals, a form of comprehensible input, provide language learners with much aid in understanding the context. Also, as language learners encounter new vocabulary or other linguistic phenomena in e-games, learning occurs if the comprehensible input is at the level of "i+1."

Affective Filter

In Krashen's (1981) Affective Filter Hypothesis, emotional variables such as motivation, self-confidence, and anxiety play a role in language acquisition. A language learner with high motivation, high self-confidence, and lower anxiety will be more likely to be successful in language acquisition. On the contrary, if a language learner does not have the above-mentioned positive emotional variables, the learner's affective filter will create a "mental block"; thus, the learner fails to perceive the comprehensible input and no language acquisition takes place.
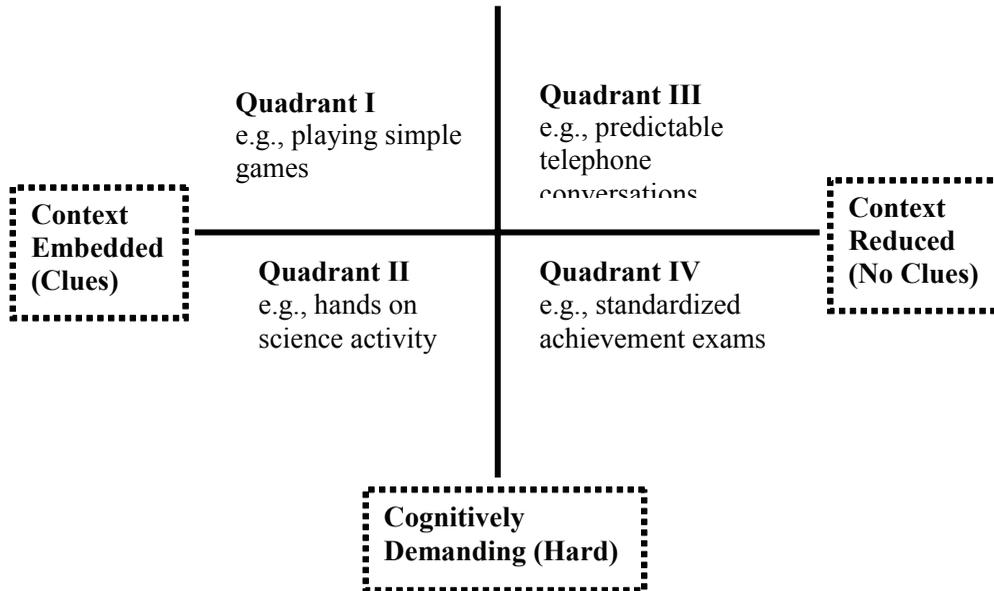
Cummins' Four Quadrants

In terms of context clues and cognitive demands, Cummins' Four Quadrants (Cummins, 1981) identify four areas of learning tasks associated with second language proficiency ranging from Basic Interpersonal Communicative Skills (BICS) to Cognitive Academic Language Proficiency (CALP). The notions of BICS and CALP distinguish social language from academic language (Zainuddin & Yahya, 2006). Social language is context-embedded conversational language in our daily lives, while academic language is decontextualized school-based learning language.

In Cummins' Four Quadrants (see Figure 1), the vertical continuum represents communicative tasks and activities ranging from cognitively undemanding to cognitively demanding, whereas the horizontal continuum illustrates communicative tasks and activities from context embedded to context reduced. Accordingly, Quadrant I refers to cognitive undemanding tasks with high contextual clues, such as the following physical directions. Quadrant II indicates cognitively demanding and context-embedded learning tasks, for example, reading texts with the help of visuals. Cognitively undemanding learning tasks with reduced context such as telephone conversations fall into Quadrant III. Quadrant IV consists of cognitively demanding activities with reduced context, for instance, understanding academic lecturers without visuals.

In the case of e-gaming, Rice (2007) emphasizes that playing e-games fosters higher-order thinking skills. Characterized by rich visual and audio aids, learning activities embedded in e-gaming fall into context-embedded learning environments. Since higher-order thinking can be integrated into e-gaming, there is potential to create game-based learning activities that are

Figure 1. Cummins' Four Quadrants (adapted from Cummins, 1981)

Quadrant I
e.g., playing simple games

Quadrant III
e.g., predictable telephone conversations

Context Embedded (Clues)

Context Reduced (No Clues)

Quadrant II
e.g., hands on science activity

Quadrant IV
e.g., standardized achievement exams

Cognitively Demanding (Hard)

context embedded and cognitively demanding (Cummins' Quadrant II). A goal of academic learning is to engage students in cognitively demanding and context-reduced learning activities (Quadrant IV). Like other CALL programs, e-gaming is not sufficient on its own. It can play "the assistant role" and can be "an aid both to the teacher and to the student" (Lasagabaster & Sierra, 2003). Therefore, it is the teacher's task to create learning activities in Quadrant IV to help students use their learning content or experience for further abstract learning.

E-Games in Language Learning

Several researchers have different views on good e-games for language learning (refer to Appendix A). Cruz (2007) contends that role-playing games (RPGs) are the ideal genre for the ESL classroom because players are exposed to "long hours of in-game dialogue" and "heavy amounts of written text" (p. 1). In discussing the value of e-games in language learning, Purushotma (2005) analyzes the virtues of *The Sims,* in which simulations provide practical vocabulary and rich

content with interactivity and flexibility. Furthermore, Purushotma argues that MMOGs, such as *The Sims Online,* have tremendous potential in language learning due to the opportunities of communicative exchanges between L1 speakers and L2 speakers.

deHaan (2003) provides very detailed analysis and evaluation of e-games. He identifies three benefits of using e-games in language learning: retaining learners' involvement, presenting rich language aurally and textually, and harnessing learners' motivation. deHaan (2003) also explores language learning opportunities in sports video games, virtual pet games, role-playing games, and simulation games. Like Purushotma (2005), deHaan (2003) also recommends *The Sims,* articulating that it is especially useful for beginning and intermediate language learners to learn vocabulary in real life. Alternatively, role-playing games present rich conversations textually and/or aurally. However, as opposed to Cruz (2007), deHaan (2003) contends that the conversations in role-playing games may be useful only for advanced language learners to decode and that the content is not necessarily related

to real life, which is different from simulation games. In playing RPGs, players cannot pause or repeat conversations, which may pose a challenge for language learners. Rather, deHaan (2003) expresses a preference for sports and simulation games because they provide more scaffolding for language learners by providing a more obvious context. Table 2 compares the strengths and weaknesses of different game genres for language learning based on deHaan's analysis.

Using E-Games for Classroom Instruction

To date, there is little research on the use of e-games for language learners in classrooms, yet current research informs our understanding on the use of e-games in language classrooms. Cruz (2007) points out that simply playing games cannot produce bilingualism, and it is necessary for teachers to design activities that encourage students to talk about their gaming experience. Cruz identifies language activities such as reflective journals, debates, and oral presentations that could be used after language learners play e-games in the classroom. Since games alone are not sufficient for learning, elements of games activated "within an instructional context" may enhance learning (Garris et al., 2002). Purushotma (2005)

stresses that it is necessary to direct students' attention to key vocabulary in playing MMOGs. Yip and Kwan (2006) contend that online vocabulary games are effective as a "warm-up," yet caution that teachers must monitor students' learning if such games are used as a long-term learning tool. Teachers can determine appropriate games for language learning, create opportunities for students to connect language learning with gaming content, and observe students' progress through formative assessments.

For implementation of e-games in the classroom, Cruz (2007) suggests that students play a language learning game weekly during instructional time or recess. deHaan (2005) proposes a "game day" or class party to invite several students to play simultaneously. Also, video games can be encouraged in language labs or in home settings (deHaan, 2005).

Tools and Technologies for Game Design in Language Acquisition

With the development of advanced technologies, some technology tools have been incorporated into game design specifically for language acquisition. These include artificial intelligence (AI), speech recognition tools, and virtual agents.

Table 2. A brief summary comparing game genres used in language learning

RPGs and Action/Adventure Games	Sports/Simulation Games
Little or no comprehensible context	More apparent context of language
Limited player interaction required for conversation	More player control required for conversations (sports games)
	More responsible language use (virtual pet and simulation games)
Little interaction with or ownership of non-repetitious language	Player's actions connect with language through reinforcement
Little language applied to the real world	Language used in "real-life" discourse
Beneficial for advanced language learners	Beneficial for beginning and intermediate language learners

AI (Artificial Intelligence)

Johnson et al. (2005) analyzed the usage of AI in the game design of the Tactical Language Training System (TLTS), a program that supports acquisition of foreign language and cultural skills. They claimed "artificial intelligence plays a key role in controlling the behavior of the non-player characters in the game" and "intelligent tutoring provides supplementary scaffolding" (p. 1). With the help of the AI in TLTS, an aide character was created to help the player when he or she gets stuck, and a virtual tutor was created that "evaluates the player's speech and gives feedback on errors, while providing encouragement and attempting to overcome learner negative affectivity" (Johnson et al., 2005, p. 2).

Speech Recognition

Speech recognition has been used in many e-games to help learners in language acquisition. With the integration of speech recognition technology, TLTS can teach American soldiers to speak two Arabic dialects (Johnson et al., 2005). It is stated that speech recognition was designed in TLTS to "classify the intended meaning" (Johnson et al., 2005, p. 3) of player utterance in order to give the feedback to the player to move the game along. However, the inaccuracy of recognizing pronunciation, and the value and relevance of speech recognition technology have been somewhat in debate (Morton & Jack, 2005). Improvement of speech recognition is needed in order for learners to learn more accurately.

Virtual Agents

Morton and Jack (2005) state that automatic speech recognition coupled with embodied virtual agents and virtual worlds have been used in CALL. SPELL systems create scenarios in which learners can develop oral skills in their target language. Godwin-Jones (2005) claims that some strategies such as "identity creation (avatars in games/chat), collaborative learning, or even mentoring (helping others in game strategies or game-related fiction writing)" (p. 17) can be used in game design to facilitate language learning.

A well-designed virtual world can provide learners with a highly contextualized environment in which the learner can interact with animated agents as an active dialogue participant (Hansson, 2005; Morton & Jack, 2005). The features of the virtual environments offer learners a sense of presence in the real world that provides an authentic learning context. Through the interaction of the learners and the virtual agents (or avatars), the low-anxiety, contextualized environment can engage learners in the learning process. With graphical representations of characters in the virtual world, avatars can lessen the anxiety that learners may have in a face-to-face learning environment. Within the virtual, contextualized environment, the use of virtual agents also "offers the learner an opportunity for one-to-one conversation, designed to contribute to an enhanced learning experience" (Morton & Jack, 2005, pp. 175-176). Learners learn more effectively and efficiently without worrying about making mistakes in the virtual learning environment.

FUTURE TRENDS

Reviewing the history of traditional games in language learning and the present use of e-games in education, we are confident, along with other researchers in this area, that e-gaming has great potential in language acquisition. With the dramatically increased attention and interest in e-gaming in education, a revolution in language learning is coming. Our perspective on the future of e-gaming in language learning is centered on classroom practice, research trends, and the challenges confronting researchers and practitioners in this field.

Classroom Practice

Future and existing language classrooms should embrace multi-player gaming. Hansson (2005) indicates that exploring the potential of MMOGs for classroom use is just beginning. Multi-player games may generate tremendous opportunities for language learners in social learning (Squire, 2006). Purushotma (2005) affirms the potential of MMOGs in language learning since it is possible for a second language (L2) learner to be partnered with a first language (L1) learner in a MMOG like *The Sims Online*. Furthermore, Purushotma suggests that teachers collaborate across countries to involve L1 and L2 players in collaboration while playing a game.

Research Trends

With limited research on using e-gaming for language acquisition, it is clear that this research area is still undeveloped. deHaan (2003) urges that various case studies, especially long-term case studies and discourse analyses, are needed to understand language acquisition in language learning. deHaan (2003) holds a conservatively positive attitude towards the use of video games in language classroom use, providing some "caveats" and questions for further research.

Also, deHaan (2003) poses many insightful questions, of which two actually resonate with our analysis of Cummins' quadrants. Can language acquired through video games be used when the language is removed from the context of the game? Can a game's language be used when the kinesthetic or contextual connection to the game is absent? These two crucial questions for application of e-gaming in classroom practice urge us to ponder if context-embedded information in e-games can crutch language learners to conduct academic-demanding learning tasks.

Some electronic games, such as *Civilization III,* are utilized in the classroom to assist the learning of social studies and history (MacKenty, 2006; Squire, 2004). Exploration and research on the use of e-gaming in the language classroom is necessary to fill the tremendous void of research. In the field of CALL, Bax (2003) suggests that "more in-depth ethnographic studies of individual environments" and "action research in individual environments" (p. 27) are needed in the future. Undoubtedly, ethnographic studies and action research will also help to expand our collective understanding of the use of e-games in the language learning process.

Considering various language learning populations, we also think it is promising to explore the potential of e-games in adult language education. Most of the research on the use of non-electronic simulations and games in language learning was conducted with children. However, some research has focused on the uses of non-electronic simulations and games in adult language classrooms (Hill, 2002; Jung & Levitin, 2002; Gaudart, 1999). Hill emphasizes that we should not underestimate "the power of play in adult language education" (2002, p. 358). Gaudart (1999) also asserts that neither simulations nor games are age dependent, and based on her own experience in Malaysia, she claims that adults may enjoy games even more than children do. Further, Kovalik and Kovalik (2002) maintain that Piaget's belief that play facilitates learning in children can also apply to adults. For adult language learners who are more competent in self-paced autonomous learning, the potential for the integration of e-gaming for adult language learners should not be underestimated.

Challenges

Although playing traditional games in language learning has been valued by many people, the introduction of e-gaming into language learning still faces many challenges. These challenges include concerns related to game design, teacher training, and assessment.

Game Design

As discussed above, with the exception of some simple online linguistic games, most e-games are not specifically designed for language learners. Language learning opportunities are more likely to be by-products of commercial e-games. Language learning educators' and researchers' increasing interest in e-games indicates a necessity for creating e-games specifically for language learners. deHaan (2003) proposes video game developers create sports, virtual pet, simulation, and modified role-playing and action/adventure games with a primary or secondary aim of teaching languages. The game design industry should initiate extensive and intensive cooperation with language educators to develop versatile language e-games for a vast market.

Teacher Training

First, the legitimacy of e-gaming is the biggest issue for teacher training. Teachers and parents may hold negative attitudes towards e-games, so there will be more debate centered on the efficacy of e-gaming and its impact on learning. Second, the emphasis for teacher training should be to guide teachers to integrate e-games into the curriculum. Previous research has suggested that novice teachers should be linked with experienced computer-using teachers to develop networks of experts in CALL (Egbert, Paulus, & Nakamichi, 2002; Strudler, McKinney, & Jones, 1999). Since e-gaming applications may still be novel, teachers should play a dual role as a facilitator of learning and a researcher in using e-games for language learning. Last, Egbert et al. (2002) claim that for teacher education, CALL coursework should be situated in the contexts in which teachers will use it. If possible, teachers should visit an experimental class where e-games are being used to gain first-hand classroom experience.

Assessment

Teachers must consider which e-games can be integrated and how they will be integrated in language learning classrooms. Teachers should also consider how students' e-gaming experiences can facilitate their academic learning and how playing e-games can promote meaningful learning. Most importantly, teachers need to evaluate e-games before using them in the classroom. Rice (2007) created a rubric and scale for educators (see Appendix B) to assess higher-order thinking in e-games which provides an overarching assessment tool for e-games in education. For language learning purposes, educators still need to consider the potential of e-games in language learning, namely, the possibilities for learners to be involved in practicing four basic language skills: speaking, listening, reading, and writing. If students play e-games as part of a class activity, teachers may wonder how to assess student learning.

CONCLUSION

This chapter provides a synopsis of "playing" and "learning" in language education. We hope to contribute an overview of research on e-gaming in language acquisition and provide a springboard for more in-depth research on e-gaming development and application in language teaching.

We acknowledge the important role of play in language learning. In fact, play has been valued by many scholars from ancient times to the present day. In ancient China, Confucius said, "Knowledge is not equal to devotion. Devotion is not equal to joy." That is, the joy of learning is more essential than the act of knowing. In ancient Greece, Plato said, "Do not train children to learn by force and harshness, but direct them to it by what amuses their minds, so that you may be better able to discover with accuracy the peculiar bent of the genius of each." Thus, learning cannot be effective without motivation. Huizinga believes

that play is the source of knowledge (as cited in Ang & Zaphiris, 2007). Therefore, we should strive to amuse the language learner's mind through playing e-games.

While affirming e-games' potential in language learning, we maintain that implementing e-games in language learning is not a simple process. In the coming revolution of "playing the language," e-game designers, researchers, practitioners, and language learners will be confronted with opportunities as well as challenges. To optimize language learning in the virtual worlds of e-games, more exhaustive research is needed to expand our understanding of electronic play and language learning.

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KEY TERMS

Artificial Intelligence (AI): Refers to the intelligence exhibited by an artificial entity. AI is a field overlapped by different areas such as computer science, engineering, psychology, neuroscience, and so forth.

Avatar/Virtual Agent: A player's representation within a gaming or simulation environment**.**

E-Gaming/Games: Electronic games including computer games and video games.

Massively Multiplayer Online Game (MMOG): A computer game that enables hundreds or thousands of players from around the world to play at the same time. By necessity, these games are played on the Internet and allow players to cooperate and compete with each other during gameplay.

Non-Playable Character (NPC): A character encountered within a gaming environment that is controlled by the AI of the game.

Role-Playing Game (RPG): A game in which a player assumes the role of a character and collaboratively plays with other players to achieve a game-related goal. Players determine their characters' actions based on game rules and on the goal they want to achieve during gameplay, which in turn shapes the outcome of the game. Interactivity among players is a crucial characteristic of an RPG.

Simulation: Imitates a situation in real life. In most research, simulation and gaming are alternative terms. García -Carbonell et al. (2001) point out that an explicit "reference system" is a characteristic of simulation or game when compared with role-play activities. However, Kovalik and Kovalik (2002) refer to Crookall and Oxford's (1990) definition of roleplay, stating that roleplay is included in the simulations used in their classrooms.

Traditional (Non-Electronic) Games: Games that do not include the implementation of any electronic apparatus such as computers or consoles; examples include board games and card games.

ENDNOTE

1. In this chapter, language learning indicates second-language (L2) learning, not first-language (L1) learning. Meanwhile, a few articles addressing foreign language acquisition are included due to the limited number of research focusing on games in L2 learning.

APPENDIX A: E-GAMES IN LANGUAGE LEARNING RECOMMENDED BY RESEARCHERS

Table A1.

Strengths and Potential in language teaching	Recommended Games
by Cruz, 2007	
Cartoon-like visuals, good soundtrack, and interesting and funny characters and plots For students "between the age of 11 and 17 in mind" (Cruz, 2007)	*Atelier Iris (Sony PlayStation 2), Atelier Iris 2 (Sony PlayStation 2), Arc the Lad (Sony PlayStation), Arc the Lad 2 (Sony PlayStation), Final Fantasy 7 (Sony PlayStation), Final Fantasy Origins (Sony PlayStation), Final Fantasy Anthologies (Sony PlayStation), Final Fantasy Chronicles (Sony PlayStation), Growlanser (Sony PlayStation 2), Lunar: The Silver Star Story (Sony PlayStation), Lunar: Eternal Blue (Sony PlayStation), Paper Mario (Gamecube), Radiata Stories (Sony PlayStation 2), Rhapsody: A Musical Adventure (Sony PlayStation), Suikoden series (Sony PlayStation/PlayStation 2), Tales of Eternia (Gamecube)*
by deHaan, 2003	
Listening, reading	*Power Pro Baseball 6 (Japanese)*

Table A1. continued

Motivation nature and encouraging responsible repletion of language applicable to "real life"	*Monster Rancher*
Real-world/life language; learning verbs and imperative (command) forms	*The Sims*
Listening, speaking, vocabulary	*Seaman*
by Purushotma, 2005	
Speaking	*Seaman*
Speaking (interaction with L1 players)	*The Sims Online (MMOG version of The Sims)*
Speaking	*Operator's Side (Lifetime in English)*

APPENDIX B: VIDEO GAME HIGHER-ORDER THINKING EVALUATION RUBRIC AND VIDEO GAME COGNITIVE VIABILITY SCALE

Table B1. Video game higher-order thinking evaluation rubric

Characteristics	**Y/N 1/ 0**
Requires users to assume a role in the game, rather than simply play.	
Offers meaningful interaction such as dialogue with NPCs.	
Has a storyline.	
Has a complex storyline with characters users care about.	
Offers simple puzzles.	
Has complex puzzles requiring effort to solve.	
Uses three-dimensional graphics.	
Allows multiple views or camera pans and the ability to zoom in and out.	
Allows different ways to complete the game.	
Simulates complex processes requiring adjustment of variables by users to obtain desired results, or adjusting variables leads to different results.	
Allows interaction through use of avatars.	
Avatars are lifelike.	
Requires interaction with virtual elements within the game.	
Requires knowledge of game elements beyond mouse prompts, number entry (e.g., combining elements to create new tools, understanding complex jargon).	
Requires gathering of information in order to complete.	

Table B1. continued

Requires synthesis of knowledge in order to complete or successfully engage elements in the game.	
Environment effectively replicates real world.	
NPCs display AI characteristics.	
NPCs display effective use of AI resulting in dynamic experiences for the user.	
Offers replay ability with varying results	
Total score: (Indicating placement on the Video Game Cognitive Viability Index)	

Source: Rice, J.W. (2007). Assessing higher order thinking in video games. *Journal of Technology and Teacher Education, 15*(1), 93. Copyright 2007 by the Association for the Advancement of Computing in Education (AACE). Reprinted with permission.

Table 2. Video game cognitive viability scale

20	*Perfect score.* Game displays highest elements of cognitive viability.
15-19	*Upper-range.* Game holds several positive characteristics lending itself to higher-order thinking.
14-18	*Mid-range.* Game is probably acceptable for some higher-order thinking opportunities.
9-13	*Lower-range.* Fewer opportunities for higher-order thinking will take place in the game.
0-8	*Little or no cognitive viability.* Typical score range for arcade-style-only games.

Source: Rice, J.W. (2007). Assessing higher order thinking in video games. *Journal of Technology and Teacher Education, 15*(1), 94. Copyright 2007 by the Association for the Advancement of Computing in Education (AACE). Reprinted with permission.

APPENDIX C: A LIST OF ONLINE RESOURCES FOR E-GAMES IN LANGUAGE LEARNING

Languagegames.org (http://www.languagegames.org/la/)
Players can improve their vocabulary in certain languages through playing these online games.

English Adventures (http://techno-ware-esl.com/engadventures.html)
Players can practice English skills including reading, writing, speaking, and listening, as well as grammar and vocabulary.

Game Zone (online English language games) (http://www.english-online.org.uk/games/gamezone2.htm)
Contains a list of English language games to improve vocabulary, spelling, and grammar.

Learning English Games (http://www.2flashgames.com/learning_english_games.htm)
Players can improve English skills such as listening and vocabulary through gameplay.

Online Word Games (http://word-games.pogo.com/)
Varied English word games for language learners to improve vocabulary and spelling.

Online Word Games (http://www.realarcade.com/onlineGamesGenre?genre=word&tps=google_ &src=mcode_nbrbp_,ogpg)
These English word games on the Web can enhance spelling and vocabulary.

Free Online Games (http://games.aol.com/word)
Learners can improve vocabulary in playing fun English word games.

Mini Clip Games (http://www.miniclip.com/games/es/)

PopCap Games—Free Online Games (http://www.popcap.com)
Learners can enrich their vocabulary and proficiency of grammar through playing spelling and grammar games on these two Web sites above.

Sveerz—Online Games (http://www.e-funsoft.com/sveerz)
Players can improve listening comprehension by playing the games on this Web site.

NBC.com—Treasure Hunters (http://www.nbc.com/Treasure_Hunters/game/)
Players will improve their listening comprehension and problem-solving skills by playing the games on this Web site.

LOGAN's Mystery of Time and Space Adventure (http://www.albartus.com/motas/)
This online graphic adventure game involves players in solving riddles and puzzles, and enhancing reading comprehension and vocabulary.

McDonalds Strategy Game (http://www.puffgames.com/mcdonalds/)
Players are invited to run the business of McDonalds during gameplay by which they can improve reading comprehension, management skill, and systematical skills.

Arcane Season 1: The Miller Estate: Episode 1 (http://www.gamershood.com/flashgames/137)
Players needs to solve some puzzles when playing this game, by which they can improve their listening comprehension during gameplay.

Teen Second Life (http://teen.secondlife.com/)
Developed for adolescents ages 13-17, this "teen version" of *Second Life* creates opportunities for teens from all over the world to chat and socialize in a 3D virtual world.

Second Life and Language Learning Discussion (http://blog-efl.blogspot.com/2007/04/second-life-and-language-learning.html)
This discussion forum is mainly about how players can learn a second language in *Second Life,* a 3D virtual online environment that provides players a place to communicate with each other.

Kyle Mawer Home (http://kylemawer.wikispaces.com/)
Kyle Mawer's wiki is about computer games (especially free online games) for language learning and teaching.