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# The Choices We Make: Game Design to Promote Second Language Acquisition

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**Abstract**

Prior research about games designed to promote Second Language Acquisition (SLA) typically involves one of two perspectives: 1. an overview of the gaming system and its architecture; or 2. an evaluation of the gameplay experience and its impact on students' SLA. Less is known about why certain game design decisions were made or how these decisions support or inhibit SLA. Thus, game designers and Second Language (L2) educators miss opportunities to learn from each other and to collaborate effectively in the game design process. This case study outlines the design process of a mobile game that promotes Spanish proficiency and reflects on this experience to understand how specific game design decisions influence certain aspects of SLA. Results reveal the correlation between design specifications and SLA.

**Author Keywords**

Communicative competence; Mobile game; Second Language Acquisition; Spanish

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

## Introduction

As an alternative pedagogical approach, videogames provide ample opportunities for players of diverse backgrounds to engage in social interactions with others, creating a supportive virtual environment that facilitates Second Language Acquisition (SLA) --- students ability to read, write, listen and speak in a second language [3,5-6,19-21,23-26, 28, 30-32, 34-35]. L2 pedagogy argues that games are ideal for teaching students effective strategies for negotiating meaning and being understood in the targeted language [9,16,27-28]. Despite these gains in utilizing videogames for successful SLA, we have yet to scratch the surface in understanding how to design videogames to support Second Language (L2) students' proficiency in a targeted language.

Communicative competence---knowing what to say, when to say it and how to say it--- is one of the primary challenges that L2 students struggle to achieve [1-2,7,14]. Given that communicative competence is the goal, then intentionally designing videogames to augment communicative competence should be based on strategic decisions made during the game design process. Likewise these game design decisions should promote particular aspects of SLA (e.g., displayed text to support reading comprehension skills in the targeted language). However, most research of games intentionally designed for SLA either emphasizes the finished product or its impact on students' proficiency in the targeted language [3,5-6,9-11,18-28,30-32,34-36]. Less is known about the correlation of game design decisions to specific aspects of SLA.

This case study outlines the design process of a mobile game designed to promote students' proficiency in the

targeted language. We reflect on the game design process to better understand how certain game design decisions support and in some cases, inhibit SLA. This research explores the following questions: *What are the affordances of prototyping as it relates to SLA? How do game design decisions support or inhibit SLA?* Lessons learned from this experience represent first steps towards correlating game design specifications to SLA.

## Related Work

Communicative competence, the learner's ability to determine the appropriate use of language based on circumstances, is crucial to developing proficiency in the targeted language [1-2,7,14]. Likewise vocabulary acquisition in the targeted language is a critical component of communicative competence since the individual must be able to choose the appropriate vocabulary according to the given situation [4,17]. However, focusing on vocabulary acquisition alone is insufficient for increasing L2 students' communicative competence [14]. In addition to vocabulary, the speaker must understand the pragmatics of the targeted language, the social context in which meaning is constructed as well as the speaker's implied meaning [33]. Pragmatics supports situational context as the basis for introducing appropriate L2 vocabulary and determining their meaning. Together vocabulary and pragmatics create language learning opportunities in which L2 students seek to communicate with native speakers in the targeted language.

Research of videogames intentionally designed to promote SLA typically involves a discussion of the finished product along one of two trajectories: 1. an overview of the gaming system and its architecture; or 2. an evaluation of the gameplay experience on

students' SLA. For example, Johnson & Valente [12] provide a system overview of the Tactical Language and Culture Training System (TLCTS) that includes game scenarios used to help players acquire communicative skills and cultural understanding in a variety of foreign languages, including French, Dari, and Iraqi. In a similar notion, Yang & Zapata-Rivera [36] describe the system components of the videogame *Game of Persuasion* designed to assist English as Second Language (ESL) students with formulating written requests (e.g., "I need to take your writing course."). Yang & Zapata-Rivera [36] also evaluate the impact of conversational interactions with a virtual character on ESL students' ability to formulate written requests.

Because videogames have emerged as alternative pedagogical tools, mobile games (a subset of videogames) have become increasingly popular for promoting SLA due to their portability and ubiquitous access. For example, Kam et al. [13] create mobile games with built-in speech recognition to assist children in rural India with successful acquisition of English vocabulary words. In another example, *Mentira*, a location-based mobile game, affords college students opportunities to visit different geographical locations in Albuquerque, New Mexico to discover clues to help them solve a murder mystery as they acquire Spanish vocabulary words [10]. These examples of mobile games utilized to facilitate SLA confirm their viability as L2 pedagogical tools. However, less is known about how the design process actually leads to the identification of appropriate game tasks and scaffolds to accommodate students' development of communicative competence.

### Iterative Game Design

Because Spanish is the second most commonly spoken language and the most commonly studied foreign language in the U.S., we select Spanish as the chosen targeted language for communicative competence [15,29]. There are three phases in the game design process---conceptualization, implementation and evaluation, and all three phases can be repeated as needed [8]. The conceptualization phase involves defining game content such as the virtual world, characters, story, rules, source of conflict, possible game outcomes, etc. and ends with a functional prototype [8]. The implementation phase involves developing software for a particular platform (i.e., a mobile device) according to the design specifications identified in the conceptualization phase. During the evaluation phase, players play the game and provide feedback to give the game design team an appreciation for the player's perspective [8]. We are currently in the conceptualization phase of the game design process and have subsequently created three different mobile game prototypes using the iterative cycle of subtasks:

1. Define new design specifications.
2. Implement the prototype.
3. Elicit feedback.

We describe the details of each of the prototypes below.

#### Prototype 1

**New design specifications:** Based upon Rankin's [22] evaluation of a conversation-based Spanish language learning video game, we identified preliminary design specifications based upon self-



Figure 1. Spanish speaking chef Senor Santiago explains the rules for playing the mobile game before guiding students through the steps for making a Spanish dish.

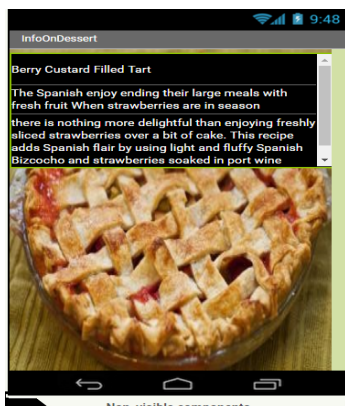


Figure 2: Cultural information about the Spanish dessert berry custard filled tart displayed in English.

reported student evaluations: 1. Personalized gameplay experiences; 2. Spanish speaking game characters or Non Player Characters (NPCs) of diverse backgrounds; 3. Information about Spanish culture; and 4. Language learning scaffolds to help students increase their SLA.

**Implement prototype:** We created our first prototype of “¡Bienvenidos a Mi Cocina!” – “Welcome to My Kitchen!” using Balsamiq, a rapid wire framing tool, to design a series of mockups that demonstrated game content (i.e., recipes of popular Spanish dishes), game tasks (i.e., players make Spanish desserts) and player interaction (i.e., select correct ingredient from list of ingredients displayed on the screen.). To provide a personalized gameplay experience (first design specification), players had the option of uploading a picture of themselves to represent their avatar during the game. The goal of the game was for players to work with Spanish speaking NPCs who represented chefs to make popular Spanish desserts. To demonstrate diversity of NPCs, we created Senor Santiago, a 28-year-old native of California and pastry chef who worked at a local grocery store and was fluent in Spanish and English. See Figure 1. For this prototype, we identified one Spanish dessert (i.e., strawberry cake) for the cooking challenge. The game displayed relevant cultural information (common practice to end a large with meal with fresh fruit) on the screen, the third design specification, before students began the cooking challenge. See Figure 2. The player had one minute to make the dessert. The recipe contained Spanish vocabulary words that facilitated players’ vocabulary acquisition. The player could view the recipe as many times as needed, an example of a built-in scaffold to promote vocabulary acquisition. Given a list of possible ingredients

displayed on the screen, the player had to say the correct ingredient in the right order to make the dish in one minute.

**Elicited Feedback:** We elicited the expert opinion of a Spanish instructor who reviewed the set of mockups to ensure that we integrated effective L2 pedagogical practices in the design of the mobile game. The L2 instructor wanted to see more character sketches of Spanish speaking NPCs that emphasized diversity in terms of gender and nationality. This feedback was driven by the fact that the L2 instructor had spent several months living in different Spanish speaking countries such as Costa Rica, Dominican Republic, etc. and understood that importance of addressing stereotypes about who speaks Spanish and cultural differences of Spanish speaking countries. The L2 instructor liked the situational context of students preparing Spanish cuisine since this introduced food related vocabulary words and conversational phrases. Overall, she was pleased with the overall concept of the mobile game.

#### Prototype 2

**New design specifications:** Though the mockups helped us formalize our game ideas, Balsamiq was not a mobile game development platform. Additionally, it lacked the ability to support speech-recognition during gameplay, an important functionality that would allow students to practice their Spanish speaking skills. Referring to the L2 instructor’s feedback about the first prototype, we identified new design specifications for prototype iteration 2: 1. Defined character sketches of diverse Spanish speaking NPCs; and 2. Support for speech-based interactions during gameplay.



Figure 3: Diverse group of Spanish speaking NPCs that represent different genders, nationalities, linguistic capabilities and cooking expertise.

**Implementation:** Given the new design specifications, we chose App Inventor as the platform for developing the mobile game since it supported speech-based interactions during gameplay. App Inventor also allowed us to view our mobile game on the android simulator, giving us a better idea of how users would interact with the mobile game.

We created a diverse group of Spanish speaking chefs of different genders, nationalities, linguistic capabilities and cooking expertise. See Figure 3. Senor Santiago, a world-renowned chef, served as the game host and was fluent in Spanish and English. Senorita Lisa was a skilled female chef from Columbia South America with expertise in preparing quick and easy to make dishes. Senor Jorge, a native of Equatorial Guinea which is the only Spanish speaking country in Africa (a fact that most students were surprised to learn) had years of experience cooking and spoke more Spanish than English. Sophia, a young woman who learned how to cook from her father and whose expertise is making desserts was born and raised in Chile, South America. She speaks both English and Spanish. After viewing each NPCs' profile, students could select the Spanish speaking chef of their choice before proceeding to make multiple Spanish desserts.

Using traditional second language assessments, Rankin et al. [23-24] demonstrated that gameplay dialogue between native and non-native speakers significantly contributed to ESL students' vocabulary acquisition in the target language [23]. Leveraging these same types of conversational interactions, we incorporated four primary types of in-game conversational patterns in NPCs' speech: 1. conversational openings & closings; 2. assertive statements; 3. requests for game or personal

information; 4. action directives to influence one or more players' future actions [23-24]. For example, NPCs greeted players ("Hola!" – "Hello!" a conversational opening) and shared personal information ("Me encanta la música." – "I love music." an assertive statement).

Because the targeted group of players was novice Spanish speakers, we selected key conversational phrases to display on the screen first in Spanish and then in English to highlight potential vocabulary words and conversational phrases we wanted students to learn. For the game tasks of making the specific Spanish dish, the recipe was only displayed at the beginning of the activity and then the NPC instructed the player step by step on what to do next to make the dish. Ingredients were displayed on the screen, and the player could simply touch the ingredient to select it. If the player selected the wrong ingredient, then the NPC gave them feedback that this was not the correct ingredient and repeated the instruction in Spanish.

**Elicited Feedback:** We sought feedback from the same Spanish instructor in the evaluation of the App Inventor version of the mobile game. Unfortunately, the simulator kept freezing during gameplay, becoming unstable partly because of the number of screens necessary to navigate through different game tasks (i.e., 14 screens just for Spanish speaking NPCs to initiate conversation with players). We proceeded to step through each of the screens in App Inventor to demonstrate some of the desired functionality (e.g., choice of multiple Spanish speaking NPCs). The Spanish instructor confirmed that the character sketches did exemplify diverse Spanish speakers and that the game introduced culturally relevant information. She also

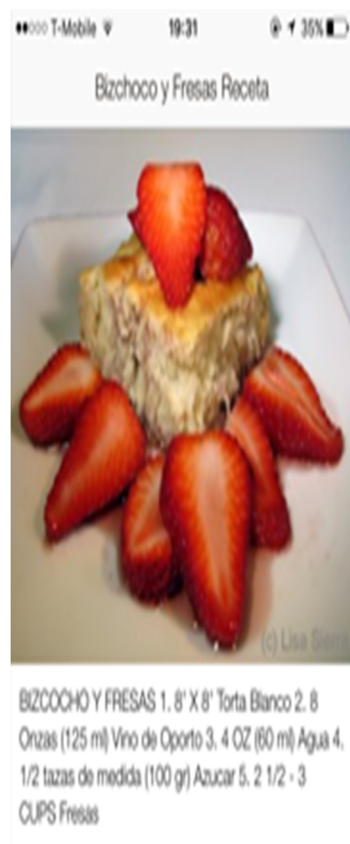


Figure 4. Recipe for *bizcocho y fresas* (strawberry cake) in Spanish.

corrected grammatical errors present in NPC's speech and text displayed on the screen. The Spanish instructor believed that the mobile game should display all text in Spanish and that all spoken language should be in Spanish, creating an immersive language learning experience. We were also advised to include a learning preparatory exercise in which Spanish vocabulary words would be introduced orally and accompanied with images to denote their meanings. She explained this was critical to priming students to pay attention to potential vocabulary words and would aid in recall (memory) and listening comprehension skills. Lastly, the Spanish instructor pointed out that the imperative or command form of verbs was usually taught in more advanced Spanish courses, so we would need to emphasize the tense of the Spanish verbs articulated in NPCs' instructions to the player. She also suggested additional recipes be included in the game.

While the App Inventor enabled us to test some of the desired functionality (i.e., support for speech-based interactions) of the mobile game, it proved to be a less than satisfactory platform for our game development effort and we were forced to examine other easy to use mobile game development tools.

### Prototype 3

**New design specifications:** The design specifications for our third prototype included: 1. Reliable mobile game development platform; 2. All text and speech in Spanish; 3. Preparatory learning activity to introduce Spanish vocabulary words; 4. NPC feedback (i.e., indication that player has selected incorrect ingredient for recipe); 5. Use of imperative verb forms in NPCs speech when instructing players to perform a particular

step in the recipe; 6. Inclusion of more dessert recipes to introduce additional Spanish vocabulary.

**Implementation:** We chose ARIS, an open source development application that had been used to create the Spanish mobile game Mentira [10] for the third prototype. ARIS is an application that can only be utilized on IOS devices, a mobile operating system created and developed by Apple Inc. This platform made it easy to publish the game while giving iPhone and iPad user/owners access to the game at any time and any place. Additionally, this platform allowed game designers to upload custom sound files such as voices of NPCs.

All spoken language and displayed text was in Spanish. We added a feature where students were able to hear voice recorded biographies of each NPC. Because ARIS did not support speech recognition, we had to limit players' responses to NPCs' conversational prompts. Consequently, we implemented scripted dialogue options to NPCs' conversational prompts. For example, a student could respond to the verbal conversational opening "¿Cómo estás?" ("How are you?") by selecting either a formal response ("Bien y tu." - "Good and you?") or an informal response ("Estoy bien." - "I'm good."). Two recipes for traditional Spanish desserts (flan and berry custard filled tart) were added to the game to increase the number of vocabulary words that students could possibly learn as a result of gameplay.

As part of the learning preparation activity, Spanish vocabulary words (i.e., "cocina" - kitchen, "receta" - recipe, "fresas" - strawberries, etc.) were introduced and accompanied with images and pronunciations. Once the player began the cooking challenge, the

recipe was displayed for approximately 15 seconds while the NPC articulated the list of ingredients and instructions in the recipe to the player. See Figure 4. The recipe disappeared and then two ingredients were displayed on the screen. The NPC would instruct the player to select the correct one required for the recipe. If the player selected the incorrect ingredient, then the NPC would tell the player ("Incorrecto!") and the game would proceed to the next set of ingredients where the NPC would instruct the player to again select the correct ingredient using the command form of Spanish verbs. Players raced the one-minute timer to make as many Spanish desserts as possible. At the end of the game students, received a score based on the accuracy of the selected ingredients required to make the Spanish dessert.

**Elicited Feedback:** We recruited 20 college students who were novice Spanish speakers (the targeted audience of players) to playtest the mobile game and participate in a group discussion to provide feedback. The majority of students found the mobile game to be useful for Spanish vocabulary acquisition and appreciated the use of images to depict Spanish vocabulary words. However, they criticized the game as being less useful for promoting speaking skills. Because all of the information and communication was in Spanish, students were confused about what to do and how to play the game. Due to repetitive play, some students eventually figured it out but suggested a mix of English and Spanish to accommodate different levels of Spanish proficiency. Finally, students suggested integrating speech-recognition capabilities to promote Spanish speaking skills and more useful scaffolds (use of the same ingredient in multiple recipes) to better

assist students with the retention of newly introduced Spanish vocabulary words.

### Lessons Learned

Referring to the aforementioned research questions, we identify the affordances of different types of prototypes as it relates to SLA and examine how game design decisions support or inhibit specific aspects of SLA. We also discuss lessons learned throughout the game design process.

The first prototype of mockups afforded the game design team the opportunity to think big and guided the design team in generating game content and defining initial player interaction. As a result, the design team had grandiose ideas about how the game would support Spanish proficiency, including vocabulary acquisition, listening comprehension and speaking capabilities. By the time we developed the third prototype (functional mobile game), we learned too late that failure to consider system requirements and the pros and cons of different game development platforms earlier in the conceptualization phase can limit which aspects of SLA the game can adequately support (i.e., lack of speech-recognition capabilities to promote development of students' speaking capabilities).

As the team moved beyond mockups towards implementing more functional prototypes, then it became more important to elicit feedback from the intended audience of players. Past game design experience taught us that players provided better quality of feedback (e.g. specific details vs. "don't like it") when they interacted with a high-fidelity prototype. If the App Inventor simulator had been reliable, we could have engaged L2 students in the evaluation of the second prototype to identify their expectations

sooner. Additionally, utilizing more high-fidelity prototypes enabled designers to test new functionality and explore different modes of player interaction.

We acquired new knowledge of what was feasible to support SLA during each iteration of prototyping, ultimately identifying appropriate scaffolds for different levels of Spanish proficiency. Because the L2 instructor insisted that all spoken and written language be in Spanish for the second and third prototypes, we thought this would create an immersive learning experience that would facilitate students' SLA. However, it became immediately apparent that students were confused about what they were supposed to do and often guessed rather than taking the time to understand what the NPC was actually saying. Consequently, students repeatedly stressed the importance of using a mix of English and Spanish in both the game instructions and the NPCs' speech. Students suggested displaying potential Spanish vocabulary words in the game instructions on the screen to draw students' attention to them and then using the NPCs to provide the English translation. The combination of displayed text and speech would serve as effective scaffolds for helping students to notice new Spanish vocabulary words while practicing their listening comprehension skills. Finally, students talked about scaffolds during gameplay that would better facilitate long-term retention of vocabulary words (i.e., using the same ingredient repeatedly in multiple recipes to promote long-term vocabulary acquisition).

As we cycled through the iterative game design process, we identified new design specifications for each prototype which exposed conflicting expectations from different stakeholders in the process (i.e., L2

teacher vs. L2 student). The L2 instructor viewed the game through the lens of being an expert, recommending scaffolds that were more appropriate for intermediate or expert L2 students. In contrast, the L2 students were novices and requested appropriate scaffolds for novice Spanish speakers. After reflecting upon this experience, we realize that we should have elicited feedback from more than one L2 instructor. Consequently, the conflicting expectations forced us to prioritize design specifications according to L2 students' needs since this was the targeted audience of players.

## Conclusion

We described the three different prototypes of the mobile game designed to promote students' SLA. Our experiences revealed misconceptions about the level of scaffolds (broad vs. deep) needed to support vocabulary acquisition for novices who have little if any functional ability in the targeted language. Second, we learned that mockups or wireframed prototypes are ideal for generating big ideas that guide the game design team but are less useful for actually testing the validity of those game ideas. In comparison, high-fidelity, functional prototypes elicit better quality feedback from students, providing key insights into simple changes that better scaffold students' vocabulary acquisition. By sharing our journey, we hope that less experienced game designers and advocates for game-based SLA can benefit from our mistakes and avoid the pitfalls that can negatively impact the final game product and players' experience. Next steps include modifications to the next version of the prototype and engaging more L2 instructors and students to playtest the prototype.



## References

1. J. D. Brown. 2003. Promoting fluency in EFL classrooms. *2nd Annual JALT Pan-SIG Conference*. Kyoto.
2. C. Brumfit. 1984. *Communicative methodology in language teaching*. Cambridge: Cambridge University.
3. A. Chik. 2014. Digital Gaming and Language Learning: autonomy and community. (J. Reinhardt, & J. Sykes, Eds.) *Language Learning & Technology*, 18(2), 85-100.
4. J. Coady & T. Huckin. 1997. *Second Language Vocabulary Acquisition: a rationale for pedagogy*. Cambridge: Cambridge University Press.
5. K. Collentine. 2012. Learner autonomy in a task-based 3D world and production. *Language Learning and Technology*, 15(3), 50-67.
6. F. Cornillie, G. Clarebout, & P. Desmet. 2012. Between Learning and Playing: Exploring learners' perceptions of corrective feedback in an immersive game for English pragmatics. *ReCALL*, 24(3), 257-278.
7. R. DeKeyser. 2007. *Practice in a Second Language: perspectives from applied linguistics and cognitive psychology*. Cambridge: Cambridge University Press.
8. T. Fullerton, C. Swain & S. Hoffman. 2008. *Game Design Workshop: a playcentric approach to creating innovative games (2<sup>nd</sup> edition)*. Burlington: Morgan Kaufmann Publishers.
9. R. Godwin-Jones. 2014. EMERGING TECHNOLOGIES GAMES IN LANGUAGE LEARNING: OPPORTUNITIES AND Where do web sites come from?: capturing and interacting with design history. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '02)*, 1-8.  
<http://doi.acm.org/10.1145/503376.503378>
10. C. Holden & J. Sykes. 2011. Leveraging mobile games for place-based language learning. *International Journal of Game-based Learning*, 1(2), 1-18.
11. B. G. Huang & J. C. Yang. 2014. The Effects of Prior Knowledge for Incidental Vocabulary Acquisition on Multiplayer Online Role Playing Game. In E. Popescu, W. L. Rynson, & K. Pata (Ed.), *13th International Conference Advances in Web-based Learning* (pp. 98-105). Springer.
12. W. L. Johnson & A. Valente. 2009. Tactical language and culture training systems: using AI to teach foreign languages and culture. *AI Magazine*, pp. 72-84
13. M. Kam, A. Kumar, S. Jain, & J. Canny. 2009. Improving Literacy in Rural India: cellphone games in an after-school program. *IEEE/ACM Conference on Information and Communication Technology and Development*, (pp. 139-149).
14. S. Krashen. 1987. *Principles and Practice in Second Language Acquisition*. Englewood Cliffs: Prentice International.
15. M. H. Lopez & A. Gonzalez-Barrera. 2013. What is the future of Spanish in the United States? Pew Research Center Fact Tank News in Numbers. Issued September 5, 2013.
16. A. Maleki. 2010. Techniques to teach communication strategies [Electronic version]. *Journal of Language Teaching and Research*, 1(5), 640-646.
17. P. Nation & J. Newton. 1997. Teaching Vocabulary. In J. Coady & T. Huckin (Eds.) *Second Language Vocabulary Acquisition: a rationale for pedagogy*, 238-254.
18. J. Pereira. 2013. Video Game Meets Literature: Language Learning with Interactive Fiction. *e-TEALS: An e-journal of Teacher Education and Applied Language Studies* 4 (2013): 19-45. ISSN 1647-712X

19. M. Peterson. 2010. Massively Multiplayer Online Role-Playing Games as Arenas for Second Language Learning. *Computer Assisted Language Learning*, 25(3), 429-439.
20. M. Peterson. 2013. *Computer Games and Language Learning*. New York: Palgrave Macmillan.
21. P. S. Rama, R. W. Black, E. Van Es, & M. Warschauer. 2012. Affordances for second language learning. *ReCALL*, 322-338.
22. Y.A. Rankin. 2016. Diversity by Design: Female Students' Perception of a Spanish Language Learning Game. In Conference Proceedings of CHI'16 Extended Abstracts San Jose, CA May 7 - 12, 2016
23. Y. A. Rankin, D. Morrison, M. McNeal, B. Gooch, & M. W. Shute. 2009. Time Will Tell: in-game social interactions that facilitate second language acquisition. In R. Young (Ed.), *4th International Conference on Foundations of Digital Games* (pp. 161-168). New York: ACM.
24. Y. Rankin, M. McNeal, M. W. Shute, & B. Gooch. 2008. User-centered Game Design: evaluating massive multiplayer online role playing games for second language acquisition. *ACM Sandbox 2008*. Los Angeles: ACM.
25. H. Reinders. 2012. *Digital Games in Language Learning and Teaching*. New York: Palgrave Macmillan.
26. H. Reinders, & S. Wattana. 2012. Talk to me! Games and students' willingness to communicate. In H. Reinders (Ed.), *Digital Games in Language Learning and Teaching* (pp. 156-187). New York: Palgrave Macmillan.
27. J. Reindhardt, & J. Sykes. 2014. Digital Game and Play Activity. *Language Learning and Technology*, 18(2), 2-8.
28. J. Reindhardt & J. Sykes. 2012. Conceptualizing Digital Game-mediated L2 Learning and Pedagogy: game-enhanced and game-based research and practice. In H. Reinders, *Digital Games in Language Learning and Teaching* (pp. 32-49). New York: Palgrave Macmillan.
29. C. Ryan. 2013. *Language Use in the United States: 2011*. U.S. Department of Commerce, Economics & Statistics Administration U.S. Census Bureau.
30. D. Ryu. 2013. Play to learn, learn to play: Language learning through gaming culture. *ReCALL* 25(2), 286-301.
31. P. Sundqvist, & L. K. Sylven. 2012. World of VocCraft: computer games and Swedish learners' L2 vocabulary. In H. Reinders, *Digital Games in Language Learning and Teaching* (pp. 237-267). Palgrave Macmillan.
32. J. Sykes. 2013. Multiuser Virtual Environments: learner apologies in Spanish. In N. Taguchi, & J. Sykes, *Technology in Interlanguage Pragmatics Research and Teaching*. John Benjamins' Language Learning and Teaching Series.
33. J. Thomas. 1995. *Meaning in Interaction: an introduction to pragmatics*. London: Longman.
34. S. L. Thorne. 2008. Transcultural Communication in Open Internet Environments and Massively Multiplayer Online Games. In S. Magnan, *Mediating Discourse Online*. Amsterdam: John Benjamins.
35. S. L. Thorne, R. W. Black, & J. Sykes. 2009. Second language use, socialization, and learning in Internet communities and online games. *Modern Language Journal*, 802-821.
36. H. C. Yang & D. Zapata-Rivera. 2010. Interlanguage pragmatics with a pedagogical agent: the request game, *Computer Assisted Language Learning*, 23:5, 395 - 412.