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## ELLE the EndLess LEarner: Exploring second language acquisition through an endless runner-style video game

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Games have been used to help people learn throughout history (Vankúš, 2005). Video games are interactive and encourage active learning (Domínguez, Saenz-de-Navarrete, de-Marcos, Fernández-Sanz, Pagés, & Martínez-Herráiz, 2013; Watson, Mong, & Harris, 2011) more so than learning via lecture or textbook reading. The interactive nature of games also makes them engaging to the player. Student engagement is an essential component of learning (Fredricks, Blumenfeld, & Paris 2004; Hall, Ramsay, & Raven, 2004; Kahu, 2013). Most scholars agree that games, when designed well, can increase student learning and retention (Ricci, Salas, & Cannon-Bowers, 2009) as well as motivation (Gee, 2003; Fullerton, 2014; Eichenbaum, Bavelier, & Green, 2014).

Sykes and Reinhardt (2013) define game-based second language learning and teaching as the “use of games and game-inclusive synthetic immersive environments” (p. 5) that are designed specifically for second language learning contexts. They also state that few game-based spaces are available specifically for second language learning purposes. Scholars have noted the unintentional effect on second language learning that commercial games can have, for example, children in countries where English is not commonly spoken have been observed as acquiring knowledge of

the language as a means to play the game (Sørensen & Meyer, 2007). Other research has focused on second language-learning interactions that learners form in multi-player video environments, including those associated with video game chat rooms (Ryu, 2013). Although some video games that target language learning have emerged, such as *Croquelandia*, *Language Island*, *Mentira*, *MIDDWorld Online*, and *Zon* (Sykes & Reinhardt, 2013), much research remains to be done in the efficacy of this game genre. The central question guiding our research is: How can a videogame best be designed to effectively enhance student second language acquisition?

To answer this question, we turn to Ellis’s (1985) recommendations to facilitate language learning: the quantity of input directed at the learner, the learner’s perceived need to communicate in the second language, and the here-and-now principles. Current second language pedagogy also stresses that learning should be authentic and goal-oriented. Drawing on socio-cultural theory, researchers have linked second language acquisition with a “language game” (Lantolf, 1997), explaining that play can allow learners to rehearse linguistic forms they already know and to experiment with new input in a low-pressure environment. The game we are developing will satisfy Ellis’s requirements for the quantity of input, the necessity for competency in the language (to advance in the game), and the “here-and-now” principle, in addition to authenticity and goal-orientation.

This session will explain and demonstrate *ELLE the EndLess LEarner*, a game prototype designed to enable the study of secondary-language acquisition through an endless runner game platform. The system is designed so that different game features, specifically auditory, visual, and textual cues, can be modified easily by a researcher and the efficacy of each studied in relation to language acquisition and the game platform. The platform has been designed in this way to allow for research into the impact of these different cues and input methods on the activities being studied.

The style of *ELLE* is an “endless runner,” which means that the player’s avatar is continuously in motion, “running” through the game environment. For example, the iOS game *Temple Run 2*, continuously moves the player forward, without allowing the avatar to stop. The only controls available to the player are turning right or left, and jumping over or ducking under obstacles. The player cannot control the speed of motion though it can be manipulated through in-game objects. This game style results in a fast pace requiring players to react rapidly, and it has great potential to

increase student motivation and engagement in the types of common sense practice exercises that help solidify vocabulary acquisition. *ELLE* is being designed in conjunction with modern language researchers and is grounded in the scholarship of language learning theories and evidence-based pedagogical methods.

We chose an endless runner style videogame to address a number of practical concerns, as scholars assert that the connection between game mechanics and intended argument must be intentional (Bogost, 2007). First, this popular style of game is intuitive and easy to play. Next, we believe the endless runner style, being a casual game, will be less intimidating for learners who do not identify as “gamers.” The fast pace of this style requires rapid recall and provides immediate feedback in a low-consequence environment that lends itself to repeated play and therefore repeated reinforcement of the content. Endless runner games limit player choices within the game, which allow for an increased emphasis on the language terms being practiced. Finally, this prototype, initially focusing on vocabulary acquisition, lays the groundwork for future iterations of the game as an on-demand language practice tool that will have the ability for instructor modification of content.

We have chosen Portuguese as the initial language for *ELLE* to teach, as it is one of the most important world languages today. As the sixth most spoken language in the world, the Portuguese language is a gateway to the cultural and economic opportunities of Brazil and the rest of the Portuguese-speaking world. From Portugal to the emerging economies of Africa, the Portuguese language has over 200 million native speakers, is an official language in nine countries, and is spoken on three continents. The US government considers Portuguese to be a language of “critical need,” especially because of the nation’s trade relations with Brazil.

*ELLE* is being designed as a game system that can continue to be studied and built upon over time. The team’s initial goal is for *ELLE* to function as the center of a variety of studies to increase understanding of second language acquisition. *ELLE* is being designed using the *Unreal Engine* and readily available tools and tutorials, to reduce costs and to allow for increased focus on the variety of cue types that are of interest to the research team. This game prototype style, with its manipulable components, will allow the team to quantify the effects of different game features and player actions. Additionally, the components can be used to increase accessibility and to adapt the game based on

player needs. This empirical data can then be leveraged and further explored to increase the efficacy of language learning games.

Our research will work to identify what motivates and engages SLA learners, relying on self-determination theory (Ryan, Rigby, & Przybylski, 2006) to ensure an appropriate balance of intrinsic and extrinsic motivational strategies. The design team’s collaboration with modern language instructors has identified a lack of postsecondary level SLA supplemental tools that students find motivating; therefore, this prototype has the potential to inform improvements to future tools for second language instruction. This game is intended to act as a supplement to instruction and other classroom activities, rather than a replacement. Because student motivation is such a major factor in learning, the learning research undertaken as part of this project will also examine student engagement using the model of mastery and performance goal orientation (De Clercq, Galand, and Frenay, 2014). Mastery of second language concepts will motivate some students while others may focus on their performance against their peers. In addition to testing the game feature of textual, visual, and auditory cues, the team is also investigating the impact of game mechanics such as leader boards on student motivation.

The team’s long-term goal is to create a robust database-driven game that can be easily customized to teach vocabulary words / phrases / pictograms from any semiotic domain, regardless of language or subject, particularly at the primary and secondary school levels. *ELLE* will be leveraged to research socio-cognitive variables of domain language acquisition. Such socio-cognitive variables include questions about how the gaming environment influences learners’ motivation and how the interaction within the multimodal space of a video game could be affected by different aspects of identity, for example, gender. Potential semiotic domains could even include STEM subjects such as chemistry and biology. In other words, the proposed project will allow the investigative team not only to develop an effective game through which to introduce a second or additional language but, ultimately, to allow the team to explore both cognitive and social aspects of language acquisition.

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