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# An Overview of Digital Games Research and Practice for Learning: A Need to have (L) MOOC for DGBL (L)*

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## Abstract
Developing, exploring and standardizing digital game based learning for EFL and English for Specific Purposes (ESP), requires a thorough understanding of learning context, gaming elements, ludical manners, as well as features of virtual reality in a real-life and career like setting. Unlike some traditional scientific approaches that focuses only on individual systems separately as a dipped in fashion approach, digital game requires a platform for understanding game genres, games' use and various kind of games in order to define game design characteristics, theories of learning in digital era and to expand the characteristics and patterns of CALL application combined with linguametric perspective for digital games. It is a means and umbrella term for combined framework for multidimetional advancements, research and practices from major areas of inquiry, namely applied linguistics, psychometrics, and edumetrics of inter, supra disciplinary perspectives and emotional intelligence which gives importance to this discussion and a need to implement, develop, blend and use positive features of various digital game types in a user friendly and massively online course platform worldwide.

**Keywords:** *CALL, Digital Game-Based Learning, Massive Open Online Course (MOOC)*

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## 1. INTRODUCTION

Digital game-based language learning is popular in international era with a growing focus on between learning and playing (Cornillie, Thorne, & Desmet, 2012). Game-based learning, characteristics, game design, the combined framework, context for game play and how to implement and evaluate them however is less prominently studied in the literature (Dehaan, 2005). Reinhardt (2015) argues that there is not enough research on how a game can be integrated into learning context. How does the nature of integration influence the learning outcomes and what role does the game and instruction play? The study outcomes might also vary as playing as in gamified, game-informed and game-enhanced settings and as the game play might function differently as the context changes from main to secondary instruction or if it is mandatory or optional (Reinhardt, Warner & Lange, 2014). Thus there is no synthesis of findings to agree if game elements and game settings together might impact gaming outcomes that is why exploring various game settings, types, designs and contexts are crucial. According to Godwin-Jones (2005) gaming elements such as scenario-based elements designed for the game and during game play course, cooperative learning or mentoring the students with game strategies to foster acquisition or learning would lead more effective outcomes.

In addition, it is suggested that language learning potentials of digital games are not sufficient, thus scaffolding guidance of a teacher through game as blended, non-game based teaching might be required inside the classroom through game as blended learning (Newcombe & Brick, 2017). On the other hand, there is increasing interest in out-of-class digital game based L2 learning research and it has yet to show how games foster learning as the focus is on autonomy and shows that there is no requirement for blended learning as game can act as tutor itself through game as tutor (Chik, 2014; DeHaan, 2005; Miller & Hegelheimer, 2006). However, other studies implemented digital games as blended learning, game as tutor and extramural and the results reveals that blended learning and game as tutor improve the knowledge significantly higher in blended learning and tutor rather than game as

outside of the classroom activity. The results illustrate longer play hours also in game as tutor and scenario based game type (Fallah Vazirabad & Farrokhi, 2020). Therefore, it is important to include and combine mostly all the different agenda to implement and design relevant digital game courses. The theoretical framework of DGBL considers various context for game play. Formally such as in experimental or lab context (e.g. Sylven & Sundqvist, 2012; Peterson, 2012), learning 'in the wild' or pedagogy in the classroom, or as played in everyday context (Thorne, 2008; Piirainen-Marsh & Tainino, 2009). Although there are several researches, but non mixed the outcomes of different context and settings in one study. Evidently, there is a link of games to e-learning which is visible in digital era and mainstream media and among teaching circles (Mawer & Stanely, 2011), academic publishing volumes of dedicated articles and discussions per paper (Reinders, 2012), journal articles and book chapters (Cobb & Horst, 2011; Sykes & Holden, 2011; Thomas, 2011; Thorne, 2012), keynotes at recent technology-themed learning conferences such as EUROCALL on massively multiplayer online games (Thorne, 2009).

Dai and Wind (2011) conclude that games hold promise, but they also note outstanding methodological issues as it starts to happen more often or starts to increase for game-related research to arrange a collection of feelings accomplished and eager for describing the affordances of games and their motivating properties than for conducting research to show that these affordances are used to reach and succeed in getting instructional goals, or to find an answer to problems found in the initial research. The same may be proof for gaming research; there clearly is strong pedagogical, research and observations in gaming, but relatively few empirical research out there that have emerged linking gaming experience to get something that is useful on proficiency measures of learning progress due to a lack of an appropriate platform. Moreover, it may be debated that the dual limited factors are firmly fixed within years, the quality of not being clear and being vague in describing the term 'digital game for language learning'. On the other hand, MMORPG games are mainly designed for

entertainment purposes and majority of players are native speakers and due to the game nature, having access to the large scale discourse and non-native speakers in all domains who improve their language is nearly impossible at the moment.

Pedagogical context of game play and learning are important factors influencing how effectively games are used. Cekaite and Aronosson (2005) studied the integration of play and gaming elements in second language acquisition and emphasized the high impact and need for the incorporation. According to Crookall and Oxford (1990), gaming techniques and strategies have very powerful means and potential for helping students to learn foreign or second language skills. Previous research on the usage of simulations and games in language classrooms have illustrated their impact to teach speaking (Macedonia, 2005), writing (Kovalik & Kovalik, 2002; Salies, 2002; Spelman, 2002), and enhance cross-cultural understanding (Jung & levitin, 2002) and communicative competence (Garcia-Carbonell et al., 2001), however eliciting students' perception on different genres and gaming elements, developing the design and then implementing them to virtual classrooms is a new approach.

## 2. DEFINITION OF KEY TERMS

Before proceeding into context of learning and ludic manners, it is necessary to clarify the key technical terminology used, discussed and related to gaming context of play. According to Sykes and Reinhardt (2012) the framework of examining research and practice in digital games and characteristics of game-informed settings is based on game and play principles applied in digital and non-digital contexts outside the confines of what one might typically consider a game. The question asked in this context is about the insights from the study of games and play that inform our understanding of L2 learning and for designing better virtual environments. Game-based is defined as the use of educational or learning purposed games (i.e. synthetic immersive environments). Game-based learning is training that uses game elements to teach a specific skill or achieve a specific learning outcome. It takes the core elements, content and gaming objectives and makes it

fun (Gee, 2003). Game-enhanced playing and learning is about use of vernacular, off-the-shelf games (i.e., games designed for entertainment purposes). Second language learning questions asked revolves around how game-mediated second language learning occur in the wild (Reinhardt, 2015). Gamification is the application of game mechanics in a non-game context to promote desired behaviour and derive learning outcomes. In other words, gamified education is defined as the implementation of game elements and game design techniques in non-game or non-digital learning contexts (Werbach, 2015). Conventionally used categories as a form of tutorial CALL, popularized the term tutor, tool as a term created by Levy (1997). The first term is defined as explicit instruction that aims to build into an application and therefore the distinction is that tool merely relies on a computer as a medium for learning, communication and a means for processing information. Prensky (2001) defines that if a game is designed and has no purpose other than play, you have a toy. Serious games are created specifically for educational use and can be tailored to specific learning and curricular needs. However, serious games also include the entertaining and engagement aspect of conventional games (Oliviera, Correira, Merrelho, Marques, Pereira, & Cardoso, 2009; Gonzilez-Gonzalez, & Blanco-Izquierdo, 2011). Conventional games in contrast with serious games are initially built in and designed to entertain players rather than have educational goals or teaching specific skills or knowledge (Calvo-Ferrer, 2018). Meantime, learning takes place in many different ways such as intentionally, unconsciously and even serendipity (Holec, 1981).

Conventionally used categories as a form of tutorial CALL, popularized the term tutor-tool distinction as a term created by Levy (1997) which explicit instruction aims to build into an application and differentiates tutor from what relies only on a computer as a medium for learning, communication and a means for processing information. Tutorial CALL games implement computer games which include identifiable linguistic elements and teaching presence specifically for improving some language proficiency (Hubbard & Bradin Siskin,

2004), which is evident in designed learning objectives and assessment strategies and objectives. In this regard, commercial off-the-shelf (COTS) games are considered as functional environments that unintentionally are supporting some language specific learning outcomes, but based on pedagogical expectations for language learning are not explicitly tutorial by nature. In the literature, COTS games are often believed to be almost related to, but distinct from, more predominantly and open-ended socially-oriented virtual worlds such as Second Life (Thorne, Black and Sykes, 2009), simulation games such as Sim Copter (e.g. Coleman, 2002), and explicitly tutorial like simulation gaming environments for second language learning (e.g. Zacharski, 2003) and therefore designing, blending and implementing the positive features and characteristics of both serious and entertainment games in one united and massively open online platform might be crucial and relevant to be able to have autonomy to select the options as the need arises and therefore have access to a more user friendly digital game based language learning research and practice platform which will pave the way for researchers, teachers, designers and students at the same time.

## 3. GAME ELEMENTS AND ATTRIBUTES

The selection and evaluation of game elements and attributes provide an understanding to the measurement of the effectiveness of specific contextual characteristics as they relate to the development of second language acquisition, students' behavioural, cognitive and motivational patterns. In a systematic literature review on game based learning, Vandercruysse, Vandewaetere and Clarebout (2012) distinguished seven gaming elements with their relevant benefits. However, with the gaming element and approach, researchers need to focus on two aspects. First, many elements, 'such as a problem to solve, competition, timing and scoring can make an activity more game-like, but they are also elements of tests, but they might not by themselves bring about cooperative engagement into educational gaming (Hubbard, 1991). Consequently, the gaming element approach critically requires a very detailed understanding of the elements that is included in the game

design (e.g., Bjork & Holopainen, 2005). Godwin-Jones (2005) states that strategies such as creating identitiy through avatars or chat in digital gaming environments, collaborative learning and mentoring students through game strategies and fiction writing are crucial elements that can be used in game design, in order to improve language learning. A highly contextualized virtual environment can promote an interactive platform in which participants can have an active dialogue and engaging interaction with the well-structured context (Handson, 2005; Morton & Jack, 2005). A well-structured scenario based virtual context offers a sense of real-life like presence and authenticity for language acquisition. This sense of presence through avatars and virtual graphical features and attributes, reduces anxiety and stress levels that students otherwise encounter in face-to-face interactions so that students feel safe to engage fully in language process.

Cruz (2007) points out that simply playing games cannot produce language, and it is necessary for teachers to design activities that encourage students to talk about their gaming experience, as this boosts their ownership of the learning and improves their understanding of the progress and process at the learning-playing stage. Cruz (2007) identifies language activities such as reflective journals, debates, and oral presentations that could be used after students play digital games in the class. Since games alone are not sufficient for learning, elements of gaming activities 'within an instructional context' promotes learning (Garris, Ahlers & Driskell, 2002). Schools are intent on the study of knowledge as factual knowledge, however, 'all the facts and information the student is studying would make a lot more sense if the student had had any opportunities to see how they applied the knowledge to the world of action and experience' (Gee, 2005). In this sense players may experience 'deep expertise' in the embodied act of thinking, acting, valuing and deciding like a professional. Also DeHaan (2003) offers many perceptive questions, of which two actually effect the quality of digital game research. Can language, features and goals acquired or used in the process of game play be used outside of the gaming context? Can the gaming language still connect to the real-life

environment if the kinaesthetic connection is removed with the device? These two crucial questions linked to digital gaming urge us to think thoroughly to understand if context embedded characteristics and features in the game environment can crutch the language to be useful to conduct in academic-demanding tasks as well? Thus educational games if perceived as assignment, the game flow' might get interrupted (Bellotti, Kapralos, Lee, Moreno-Ger, and Berta, 2013). The process of development also includes relevance, embedding, transfer, adaptation, immersion and naturalization of games for an authentic goal (Gunter et al, 2016). We also agree with Clark (2001) that all instructional media contain both technological and pedagogical elements to keep the student interested and to acquire knowledge in order to train the players.

## 4. DIGITAL GAME GENRES

A video game genre is a specific category of games related by similar gameplay characteristics. Video game genres are not usually defined by the setting of story of the game or its medium of play, but by the way the player interacts with the game (Rollings, Andrew, Adams, Ernest (2003). Genres may encompass a wide variety of games, leading to even more specific classifications called subgenres. For example, an action game can be classified into many subgenres such as platform games. Some genres, most notably browser and mobile games, are commonly classified into multiple genres. There are a number of genres (e.g. action, action-adventure, role-playing, simulation, strategy, sports, MMO, multi-genre, sandbox/open world games and scientific studies). In a University of Queensland study, game enjoyment was correlated with attributes such as immersion, social interaction, and the nature of the goals (Sweetser, Penelope; Wyeth, P. (2005). These may be underlying factors in differentiating game genres and outcomes and perceptions. It can be said that playing digital games subsidize and excel where many schools do not – in the use of learned content by doing and through action. Gee (2003) highlights that such games attempt to assume a virtual identity. It is possible to create and develop a character completely unlike yourself, who will encounter different personalities in the game unlike the ones who we meet in real-life and

face-to-face situations. In other words, games are social environments where it is fundamental to complete certain objectives and stages in order to succeed. Reinders and Wattana's (2012) study challenges the limitations of our categories by finding a new use of the current games into a digitalized instrument that is in coordination with specific learning objectives, and here it is intentionally ordered so that it illustrates and also collects the data about the relationship between game-enhanced and game-based research. When players play games in online environments they often emphasize interactivity and individual action as significant practices. Interactivity is understood in a wide perspective as communication patterns in conversation, consultation, transmission and registration (Jensen, 2000). These understandings to some extent coincide with communicative and socio cognitive approaches to language and language learning, i.e. the prioritisation of negotiation and communicative ability (Warschauer & Kern, 2000). In off school context, students thus generally understand and use languages as a means for communication, information gathering and gaming, whereas in school the understanding and use of languages may be understood to be a goal of the activities, i.e. an aspect of an intended learning process in which language may be understood as an internal system to be learned (Sorensen & Audon, 2004, Warschauer, 2004). As argued by Warschauer (2004), interactivity and the fulfilment of a meaningful purpose for a real audience is a significant issue in internet activities as 'the purpose of the studying becomes not just to learn it as an internal system but to be able to use it and have a real impact on the world' and its changing demands.

## 5. DIGITAL NATIVES AND DIGITAL IMMIGRANTS

There is a distinction between native speakers of the digital language of computers, video games and the internet as they are born with the technology already installed on their mobile phones and unconsciously pick up the digital developments while digital immigrants, those who are not born into the digital era but at some point in their life began using technology and therefore are not born with these characteristics and are 'New' students of today (Prensky, 2001). The distinction

between the two and other subcategories are therefore crucial in future pattern recognition of game research and practices as the results might vary regarding the features and requirements for each group.

## 6. INVESTIGATING GAMES IN VARIOUS LEARNING CONTEXT

Despite numerous research data, that confirms the positive effects of digital games, their integration into various formal educational contexts of English for Specific Purposes (ESP) or EFL is still relatively few and construction of computer games is seen by some to be a highly motivational and practical approach in computer programing concept as well as other relevant research domains. Game-based learning and game-based construction both suffer from a dearth of empirical evidence supporting their validity as teaching and learning approaches (Wilson, Hainey & Connolly, 2013). This study and similar researches will contribute to the empirical evidence in game-based contribution by providing the results of observational research across different levels of PE and will provide pedagogical guidelines for assessing programming, implementing and game genre evaluation and abilities by using a game-based construction approach.

## 7. CONTEXT OF LEARNING AND LUDIC ELEMENTS

The concept of ludic engagement as a form of developmentally productive activity has likely existed for as long as formal approaches to teaching and learning. Over the last years, there has been an increase in interest in computer games and apps designed for learning (Cornillie, Thorne & Desmet, 2012). Similarly, the design and use of various types of digital games for the purpose of learning or teaching. Blended (Hybrid learning) and why quality matters and the debate has more or less always existed, although the term itself is defined as a rich, supportive learner-centred context where the 'right blend' is considered as an effective learning and teaching environment that increase the learning opportunities where the process of learning becomes more enjoyable. There are various definitions for blended learning, but they all have the following in common: they refer to two different learning environments: 1) face-to-face (synchronous) and 2) online

(asynchronous); and they refer to blending those two learning environments in such a complementary way that a combined program of study is supported from both within the classroom and outside. In other words, the term blended learning indicates a programme of study that is delivered by appropriately combining synchronous face-to-face interactive mode with an asynchronous (individual) study which is often online. Hence, the effective integration of blended learning is fundamentally about making the most of the learning opportunities, potentials and tools available to achieve the 'optimal' learning outcome and complement one another in an integrated way so that we can say, it's in the blend!'. When a blended approach is used appropriately in the class, it becomes an effective way for teachers to accomplish their multidimensional role. As students have various learning styles 1) visual or aural (i.e. learn better through pictures, images and sounds) for example, watching videos or listening to audio 2) Verbal (i.e. preferring to use language) through, for examples, reading a text or asking students to prepare a spoken or written text 3) logical by for example, using an inductive approach to grammar, the right blend helps teachers by maximising the strength of each context. Teachers can also blend activities online and in the classroom that would suit other learning styles such as social (interpersonal) by asking students to cooperate in a task, or solitary (intrapersonal) by elaborating on activities that students accomplish through a more autonomous and self-study approach. Online learning gives the flexibility to be together and apart, learning and to be connected anytime and anywhere, at any time, situation and place (Garrison & Kanuka, 2004). However, online environments must aim to have a learner-driven approach and not merely be technology-driven (Salaberry, 2001). From second language acquisition research we comprehend that fact that in order for students to acquire deep language learning, one of the strong mechanisms is for them to teach others as well and can be better done by the process of peer exchange of information (Lai & Li, 2011). Blin (2004) has pointed out, 'some CALL applications may… promote the development and the exercises of autonomy, provided that students are already significantly autonomous' (p.381).

## 8. THEORETICAL FRAMEWORK

The theoretical framework is also undervalued and significant to initiate for learning and making the investigation on the degree of learning and playing and therefore the tension between the two as a crucial factor through Zone of Proximal Development (ZPD) and scaffolding. Vygotsky consistently defines the zone of proximal development as the difference between the current and potential level of cognitive development by maintaining problem-solving activities with teacher or peers. Vygotsky believed that a student would not be able to reach the same level of learning by working alone and scaffolding and identification of current knowledge is required (Vygotsky, 1978). Digital game research and practice for teachers and researchers as well as designers are also in line with chaos/complexity theory in which system theory provides a means of exploring items in terms of their internal connectivity/ interactions and their external relationships with their surroundings (Larsen-Freeman, 1997). It is therefore crucial to adopt system theory as a means of investigating and describing the digital game development based on a combined framework of literature review. Meanwhile, there are mixed features in the game design and implementation (e.g. to build your own games vs. adopting or using an existing game) based on Cornillie, Clarebout, & Desmet, 2012; Hitosugi, Schmidt, & Hayashi, 2014; Reinders & Wattana, 2012) and this requires a dynamic system of evaluation, design, feedback and therefore implementation. Moreover, there is no agreement on what a 'game' is, 'what kind of games', to 'what use of games', or what game elements and preferences are crucial, that not only requires a dipped into approach, but also is linear as well as being a complex investigation, research and practice of various aspects and meta-analysis. Researchers therefore need to be cautious of two things: although gaming elements approach such as problem solving, timing, scoring and competition make an activity a fun game, but there is more to a ludic approach than that. Laufer and Hulstjin (2001) conclude that student involvement is the main factor influencing overall effectiveness. When game designers for educational purposes make games, they should also focus on the design of failure states as well as

success states which should be in harmony with the game flow, process and outcomes. It is important to ask to what degree and when the failure side should be used and occur more than success and if it is non-intuitive to say that much failure and success side is considered boring (Wright, 2003).

## 9. COMPLEX ECOLOGY OF DIGITAL GAME PRACTICE

Reinhardt and Sykes (2014) meta-analysis, collection of articles and review of game and play activities in second language teaching and learning, focuses on a unique perspective and represents play and gaming as part of a complex ecologies of practice. The approaches include observation of out-of-school L2 gaming activities, implementation of a game-based second language learning context, and the study of 'gameful' acquisition and learning through play in close social networks. The globalization of the digital gaming industry, the diversification strategy of gaming elements into culturally new hybrid genres, a globalized elaboration in access to broadband, and increasing amount of non-traditional gaming players have precipitated a notable expansion of digital game and play activity into new contexts of practice and applications. The developments warrant consideration by practitioners and researchers for the potentials that digital games and play activities have for technology-enhanced second language learning. Each article approaches the topic from a different perspective and represents digital games and play as elements of a complex L2 ecology. The learning contexts range from the use of informal commercial, off-the-shelf digital games for autonomy in language learning to the playfulness and 'spinning off' of learning in a Twitter-enhanced or Language MOOC environment. Hence, they briefly evaluate the framework for categorizing work in digital games and second language learning (Reinhardt & Sykes, 2014) and then highlights the modes in which each of the contributions have particularly approached game and play dynamics from a specific aspect. Meantime, Godwin-Jones (2014) meta-analysis of COTS games, opportunities and challenges, highlights that educational games if perceived as assignment, the 'game flow' might get interrupted (Bellotti, Kapralos, Lee, Morendo-Ger, and Berta,

2013). Thus, finding a balance between the learning and play and game type and use are crucial factors.

## 10. LINGUAMETRIC PERSPECTIVE OF DIGITAL GAMES

According to Farhady (2009), multidimensional advancements lead the direction toward developing theoretical models of language ability, materializing the outcomes and the processes of construct. These developments can be attributed to three major areas of inquiry, namely applied linguistics, psychometrics, and edumetrics that can be adopted for digital game research and practices. The purpose therefore is rooted and benefited from both intra-disciplinary areas as well as inter-disciplinary and supra-disciplinary perspectives and factors. It is doubtless to say that the nature of the construct to be measured and outcome of the measure should be all addressed and discrete-point and integrative approaches to language, and Farhady' model of functional competence as well as supradisciplinary factors should not be neglected in this regard. Thus digital game practices and research should dip into applied linguistic domain of language assessment as well as establish relationship between psychmterics dimension. There is still a wide gap between theoretical and idealizations and therefore practices. The multidimensional framework to include phonology, morphology, syntax and semantics based on the relationship between discrete-point and integrative approach to language should be integrated wisely to the game types and genres and linguistic and psychological components for true competence for intra, inter, and supra-disciplinary interfaces (Farhady, 2009). According to Canale & Swain model of communicative competence that argues not all people could be communicatively competent in all given language contexts. This therefore implies that a focus on linguistic competence, social competence as well as discourse competence within genre studies, measuring language ability and different goal oriented outcomes of task based learning approach is complex in nature and requires development in different digital game settings, equally well in various domains for creating real-life like experiences (e.g. medicine and engineering) by a focus on theories of language learning to promote required skills for

each setting of ESP. Thus having creativity and providing picture both from applied linguistic domain as well as pragmatic, testing, psychometric, construct irrelevant dimension and edumetric domain frameworks from all the mentioned aspects have a crucial role in implementing MOOC for DGBLL.

## 11. CONCLUSION

The current summary and overview revealed a linguametric perspective of game design and implementation as well as definition of game types and genres. It suggested virtual reality, twitter-enhanced or MOOCS in general and language MOOCS platforms in particular to implement game-informed, game-based and gamified apps and aspects of learning and can be seen as building a search engine for online and personal learning. Game attributes such as immersion, cooperation and the nature of goals were discussed briefly. The relationship between discrete-point and integrative approaches were also reminded to improve digital games. Adapting and adopting social, discourse and functional competence and goals were also reminded. Thus the authentic digital games and their tasks will include more real life activities than before. To conclude, psychometric dimensions should be in harmony and in relationship with linguametrics, game elements, teacher and student perceptions and adapting or adopting games in various dimensional settings.

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