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Expanding the Game Design Play and Experience framework for Game Based Lifelong Learning (GD-LLL-PE)

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Introduction

Digital games open new opportunities for engaging people from different ages and backgrounds in ludic activities. Sometimes, digital games are just played with play as the sole objective (Brown & De Schutter, 2016). In other cases, the game experience is combined with some other intentional purposes such as lifelong learning. This book articulates two ideas, exploring their interconnection and their potential: the idea of lifelong learning (LLL) within the game based learning (GBL) studies. For this reason, we designate the use of digital games for this purposes as an approach that we call Digital Game-Based Lifelong Learning (DGBLLL) (Romero, 2015). This goal of this collection of essays is to provide an overview of current ideas and experiments in DGBLLL across the lifespan with a focus on older adults as potential lifelong learners. This includes a consideration of the age-specific game design requirements and the technological devices that may address the hurdles faced by children and older adults in the use of digital game technologies. In addition to a consideration of the current state of the DGBLLL and the methodologies provided for age-specific game design, development, implementation and assessment, a significant portion of the book focuses on case studies where DGBLLL experiences were designed and implemented.

To guide the reader through the different chapters of the book, we introduce an expanded version of Winn's (2008) Game Design Play and Experience (GDPE) framework. We name this modification the Game Design for Lifelong Learning Playful Experience (GD-LLL-PE), and include three new considerations that are not included in Winn's original framework. Firstly, the educational context and a lifelong learners' needs analysis (Leone, 2013) is proposed. The purpose of this analysis is to identify contextual and learner specific learning needs to adapt the game design. Secondly, we include the pedagogical integration of digital games as an important step between game design and the effective implementation of game and learning experience (Romero & Barma, 2015). Thirdly, we consider the evaluation of the learning experience and its outcomes. These three main changes are motivated by a specific need for a learning-based perspective in Digital Game Based Lifelong Learning (DGBLLL). This approach requires us to analyze the

learning context, the learners' need, and the pedagogical integration and the evaluation of the game and learning experience with care. The Game Design for Lifelong Learning Playful Experience (GD-LLL-PE) framework responds to the research complexity arising from game design, play and learning activity analysis and the evaluation of the game and learning experience in DGBLLL. Before introducing GD-LLL-PE framework, we discuss the lifelong learning challenges at the base of the GD-LLL-PE framework.

Lifelong learning as a 21st century challenge for all

From childhood to older adulthood, 21st century citizens are invited -- and at times can feel pressured --to engage in lifelong learning in an attempt to adapt to the rapid changes of in the circulation of information and proliferation of digital technologies (Romero, 2015). Lifelong learning may be perceived as an imposition of digital information and the processes of mediatization on younger and older adults, especially for those who have had negative learning experiences in their past (Hanson, Bruskiwitz, & DeMuth, 2007; Sawchuk, 2013). Game-Based Learning (GBL) aims at engaging the learner in active and playful learning experiences to address the traditional dichotomy between learning and playing. This book examines the potential of GBL to enhance learning across the lifespan. Core to this approach is play, which is widely accepted within educational studies as a 'natural' way for children to learn (Edwards, 2002). However, play in adulthood is often perceived as a mere hobby, a pastime or a waste of productive time (Okojie, 2011). Given these pejorative associations, what then, are the potentials and the implications for playing games across the lifespan? A more profound examination of the perceptions of games and play across the lifespan is required in order to give an articulate answer to this core question. The proliferation of digital games within the current mediascape and the diversity and multitude of games found in game universes, narratives, mechanics and devices makes digital games potentially appealing to adults of all ages. Digital games are generally designed around a ludic intention that aims at offering a positive game and learning experience (Padrós, Romero, & Usart, 2011). Game playing can be a compelling activity that may provide a series of self-administered, level-based challenges that are self-regulated by players. Through a game interface, players may take a break from their current realities and exert a level of control in an environment of relative, risk-free failure (Boyle et al., 2016; Hainey et al., 2014). The authors who have contributed to this volume argue that game design can be repurposed as a means to implement lifelong learning challenges unique to this moment in our media history. This book, which is comprised of a collection of case studies, highlights the opportunities and challenges for an engagement with digital games across the lifespan. Its focus is oriented towards the question of whether there are age-related needs, interests or desires that can and should be considered for game design, development and implementation. To guide the reader through the different chapters of the book, we introduce the Game Design for Lifelong Learning Playful Experience (GD-LLL-PE) framework in the next section.

elements that are absent from Winn’s discussion: first, an analysis of the content and learner explores the designing of serious games; second, a consideration of pedagogical integration that is oriented towards understanding how a game is used in specific pedagogical contexts. We also recommend a change to one of the terms used in Winn’s four-fold explanatory framework that includes learning, storytelling, gameplay and user experience, as mentioned. We recommend changing the term ‘storytelling’ to the broader concept of ‘game universe’, which includes storytelling and other aesthetic components of the game. The table below introduces the combination of the game-play phases and perspectives that will be considered in this book.

Figure 1 shows the expanded release of the Game Design Play and Experience framework (Winn, 2008) named Game Design for Lifelong Learning Playful Experience (GD-LLL-PE) framework. In figure 1, the concepts in *italics* aims to stress the structural differences between the original model and the GD-LLL-PE including two new phases and a broader level consideration of the game universe. Throughout the book, the GD-LLL-PE framework introduced in figure 2 provides a roadmap to navigate the different chapters of the different authors.

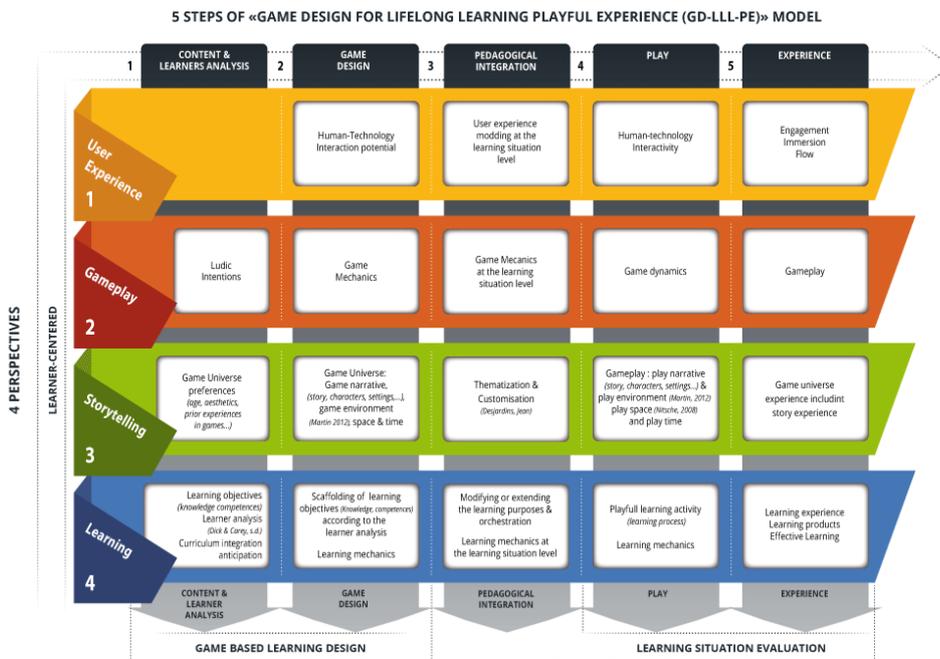


Figure 2. Game Design for Lifelong Learning Playful Experience (GD-LLL-PE, Romero, 2016).

Introducing the five phases of the GD-LLL-PE framework

In the next sections we describe each of the five phases of the GD-LLL-PE framework and introduce the chapters that are related to each of the phases or to some of the components of these phases.

Phase 1. Context and learner analysis

When integrating a digital game or creating a new one for educational purposes, we should take into account the lifelong learner needs. Conducting or engaging in learner analysis is an essential component of the approach that we are proposing. A learner analysis is a “systematic effort to identify learner characteristics and individual differences that may impact learning such as prior knowledge, personality variables, aptitude variables, and cognitive styles” (Dabbagh, 2003, p. 39). Such an analysis assists in ensuring that the situation and the game-based learning activity are adapted to the learner characteristics, needs and preferences. The learner analysis should be undertaken before deciding the type of game that will be integrated for educational purposes. This analysis should be taken into account by game designers (in case of a new game creation), educational professionals or leisure staff who are in charge of deciding the lifelong learning activities to be proposed to the learners. Before engaging in the creation or integration of games, we could benefit from an analysis of the lifelong learners needs to better respond to the learning context and the learners’ needs and preferences.

The decision making related to the integration of games in education should be done with the learner in mind. Following Dick and colleagues (2001) and Morrison, Ross, Kemp and Kalman (2010) we identify several characteristics of the learner that should be considered for each of the four perspectives of the GD-LLL-PE framework.

Learning perspective. Lifelong learners’ prior knowledge and experience, the level of their skills and competences before starting the learning activity.

Game universe perspective. Lifelong learners’ game universe preferences may be influenced by their prior experience in games, their age, values, aesthetics, or their technological preferences. Game universe preferences may be related to different play modalities (individual as opposed to collective modalities; cooperative, competitive) and to preferences for different forms of interactive engagement, such as a lecture, discussion, the use of case studies, examples,, learning by doing or other pedagogical strategies. Quickly analysing and taking into consideration learner preferences may help the process of decision-making and make the model fit, at a certain level, with the expectations and preferences of play and learning of lifelong learners.

Gameplay perspective. Here we consider the lifelong learners' known technological competencies and preferences. What is important here is to be attentive to the ways that digital ageism may operate in a learning context. Most important here is battle immediate perceptions that equates older adults with lower levels of interest and competencies in relation to technologies (see Ouellet, Romero and Sawchuk chapter). The diversity among the lifelong learners' preferences and competences that we have encountered in our own experiences teaching digital game design or programming workshops is important. As such, we consider both younger users and older adult users are not homogeneous entities. There is a great deal of diversity within. From a value-based perspective, allowing for a degree of technological choice respects the technological preferences of individual users across the lifespan and helps to mitigate the social or psychological pressures that positions technological 'adoption' as an external requirement to fit into digital society. Technology innovation as an external requirement has been described by Thierer (2014) as a "permissionless innovation". This external innovation is considered as an imposition which does not always fit the interest and needs of lifelong learners. Choosing to live and play without technologies is a choice that should be respected, valued and understood. The views and perspectives of digital experts and enthusiasts should not be taken as an eternal or gospel truth, nor is there a need to become a digital missionary. We do not advocate turning individuals who prefer analog interactions or non-digital games into digital aficionados, be they young or old age.

User experience perspective. Here we draw attention to lifelong learner attitudes and preferences towards the content related to the learning objectives, their intrinsic and extrinsic motivations and their age and cultural diversity. Diversity should be respected both in terms of intra-psychological factors and the social and cultural dimensions that shape the experience perspective and thus influence the use of games

Phase 2. Game Design

Game design is the second part of the Game Design for Lifelong Learning Playful Experience (GD-LLL-PE) framework. Several characteristics should be considered to show what is taken into account when this stage is reached. As Winn (2008) outlines, many intricacies must be taken into account when designing a DGBLLL game. Different game design factors for each of the four perspectives of the GD-LLL-PE framework that we have identified include:

Learning perspective. Scaffolding of learning objectives according to the learning analysis.

Game universe perspective. Game universe (including game narrative elements like the story, characters and settings), environment (Inal & Cagiltay, 2007), game space and game temporalities (Romero & Usart, 2013).

Gameplay perspective. Learning mechanics are “building blocks of learner interactivity, which may be a single action or a set of interrelated actions that form the essential learning activity that is repeated throughout a game” (Salen & Zimmerman, 2004, p. 316). Game mechanics should be considered both with a ludic intention and in coherence with the learning objectives and learning mechanics in order to be synergetic.

User experience perspective. Human-technology interaction potential of the different technologies should be chosen based on the analysis of the context and the lifelong learners’ preferences.

Phase 3. Pedagogical integration

Pedagogical integration is the junction point where the game is mediated by the teacher through a pedagogical activity and where learners are given access to the game. We identify different pedagogical integration factors that should be considered for each of the four perspectives of the GD-LLL-PE framework.

Learning perspective. Modification and extension of the learning objectives or mechanics through the pedagogical integration in a particular learning situation.

Game universe perspective. Customisation through the use of a theme during the learning activity (Desjardins, 2015). Some elements of the game universe including play environment and narrative (story, characters, settings, ...) could be defined at the learning situation level as a way to extend, restrict or modify the existing game environment and narrative.

Gameplay perspective. Game mechanics at the learning situation level. *User experience perspective.* User experience ‘modding’ at the learning situation level. The term ‘modding’ is often used within the computer game community to refer the act of creating new or altered content. In educational settings, El-Nasr and Smith (2006) considers game modding as a learning activity.

Phase 4. Play

The play phase is the moment where the learner is interacting with the game. Through the play phase, they are confronted to the intricacies of the mechanics and design of the (serious) game. It is the first part of the learning situation and evaluation of the game. Returning to our four-fold schema, we identify the factors influencing play that can be considered as a part of the GD-LLL-PE framework as it unfolds in this phase.

Learning perspective. The learning dynamics is the actual interactions developed by the learner within the learning mechanics constraints that have been introduced in the game design phase.

Game universe perspective. Gameplay including play narrative (story, characters, settings ...), play environment, play space (Nitsche, 2008) and play time.

Gameplay perspective. Game dynamics is the actual play activity within the constraints and possibilities defined by the game dynamics. E.g. a learner can decide to avoid the point collection despite the game mechanics of point collection implemented in the phase 2 (game design).

User experience perspective. Actual human-technology interactivity between the lifelong learner (player) and the game.

Phase 5. Experience

The last phase describes the player's immediate experience of the serious game that has been developed or played. It constitutes the last part of the learning situation and evaluation of the game. Returning to our schema, the four perspectives of the GD-LLL-PE framework, here are the different game experience and learning experience and outcomes factors to be considered.

Learning perspective. In the experience phase we evaluate the actual experience of the lifelong learner (player) within the play activity-event. The learning experience should also consider the effective learning. In this sense, the game experience and outcomes could be analyzed through the learning analytics included in the game or through learning assessments included at the learning situation level (outside the game).

Game universe perspective. Game universe experience refers to the subjective experience of the lifelong learner player within the game and what are the effects of the game universe perspective.

Gameplay perspective. We should analyze at which point the game experience of the lifelong learner player has been pleasant and ludic. Player enjoyment in games could be evaluated through different instruments, such the GameFlow by Sweetser and Wyeth (2005).

User experience perspective. In this perspective we should analyze the user experience perception in terms of flow (Chen, 2007; Csikszentmihalyi, 1990), immersion (Jennett et al., 2008) and engagement (Brockmyer et al., 2009; Margarida Romero, 2012).

The GD-LLL-PE framework, a roadmap for the book reader

The expanded game play model that we have articulated above is used as a heuristic device to organize the book chapters and to stimulate a discussion thread. As the field of game studies is rife with approaches and opportunities, each author who is presented within this collection will illuminate different aspects of game-based learning across the life course in a unique way.

The chapters published within this book are centered on a multitude of themes including game design for lifelong learners, creating games in intergenerational context and the evaluation of games as cultural artefacts that convey age and gender stereotypes. Serious games are an emerging, vastly complex topic of research and the authors approach the topic using different epistemologies, sensibilities and sites for the investigation of different research topics. Taken together, the collection should not be considered as a monolith but as a multifaceted ensemble of interconnected works-in-process. The editing team has organized the contributions submitted by the authors around the five steps explicated in the GD-LLL-PE. de Schutter, Restorick Roberts and Franks take into account game content in combination with a learner analysis and thus contribute to the four perspectives of the GD-LLL-PE that we have outlined, including: learning, game universe, gameplay and the user experience (chapter 2). Sauvé (chapter 3) provides critical information about adaptive game design for seniors and older adults through gameplay and learning. Hausknecht, Neustaedter and Kaufman (chapter 4) reflect upon game design and creating serious games for intergenerational collaborative learning. Barma, Romero and Deslandes (chapter 5) interrogate maker spaces and their potential for intergenerational learning through game design and play. Ouellet, Romero and Sawchuk (chapter 6) highlight the opportunities and hurdles involved in the creation of intergenerational workshops to create playful situations and experiences. Barma and Daniel (chapter 7) examine the pedagogical integration and possibilities offered by an innovative learning and teaching tool through the four perspectives. Ferreira, Sayago and Blat (chapter 8) inform us about the need for playful and effective learning activities that take into account experiences that are oriented towards older adults. Schuch theorizes and describes the user's experience and the engagement and the flow of the game (Schuch, chapter 9).

The categories, topics and themes introduced are by no means mutually exclusive. As you will discover by reading this collection, the chapters are intertwined with one another. This plurality of methods, research topics, and sites for intensive investigative inquiries constitutes the multi-faceted character of the (serious) game studies community in its present form. It also allows us to consider GBLLL as a powerful terrain of collaborative and collective experimentation to enhance, prolong and invest in the learning process across the lifespan. With serious games as its interface and learning at its core, the book presents a portrait of research that integrates different age groups across the different phases of game design, play and experience process to make it more diverse and inclusive.

The expansion of Winn's framework (2008) also nuances the categorization of the different realities of games (and game design), highlighting the dynamics and complex interactions present when we examine game development and game play within the serious game field. As a representation, it visualizes some of the phases of the learning process as well as the scope and range of activities being undertaken by those who are invested in the subject of serious games and lifelong learning and play: from the idea, through the design process and its experience by the player, its potential as both a tool for teaching an analysis is far-reaching. As such, the GD-

LLL-PE acts as a roadmap to navigate the work of the authors who have participated in the making of this book and as a tool to categorize or situate the different types of research in the DGBLLL field. In this way we hope that the collection and the schema we have described will contribute to ongoing advancements in the development of common research tools in the interdisciplinary field of Digital Game Based Life Long Learning.

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