DESIGNING EDUCATIONAL ALTERNATE REALITY GAMES: INTRODUCING THE MAQUETTE DESIGN FRAMEWORK

Introducing the Maquette Design Framework

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Abstract

We present the Maquette Framework for designing educational Alternate Reality Games (ARGs). The framework synthesizes prior ARG literature and integrates the authors' experience designing and running three different ARGs with over 4,000 players. The Maquette Framework can be used generatively (to help create educational ARGs) or analytically (to review existing ARGs). The framework is represented by a table with four foundational pillars (audience, learning outcomes, setting, and This is Not a Game). A tabletop represents the narrative theme, upon which rests a three-dimensional model (i.e., maquette) game world that represents the pervasive transmedia interface of the game. Upon the game world are players, gamerunners, and fictional characters; activity diamonds consisting of learning activities, learning goals & assessment, educational scaffolding, and game mechanics; and story fragments. Player trajectories are various pathways that players take through the maquette. Elements and their relationship to one another are explained and illustrated with examples.

Introduction

Alternate Reality Games (ARGs) are a "genre of transmedia practice where players collaboratively hunt for clues, make sense of disparate information, and solve puzzles to advance an ever-changing narrative that is woven into the fabric of the real world" (Bonsignore, Hansen, Kraus, & Ruppel, 2012a, p. 25). While originally developed for marketing purposes (Kim, Lee, Thomas, & Dombrowski, 2009), the potential value of ARGs as an educational platform has been recognized and explored for over a decade. Educational ARGs have been developed to support language learning (Connolly, Stansfield, & Hainey, 2011), computational thinking (Fraistat, 2017), scientific inquiry (Pellicone et al., 2017), information literacy (Bonsignore, et al., 2012a; Johnson, Buhler, Hillman, 2010), counterfactual historical thinking (Bonsignore, et al., 2012c), globalization (Waddington, 2013), and many more topics (Whitton & Moseley, 2012). They have also inspired additional educational simulations and platforms, such as Playable Case Studies (Balzotti, Hansen, Ebeling, & Fine, 2017) that borrow ARG principles such as "This is Not a Game" (TINAG) ethos (McGonigal, 2003). Educational ARGs and related genres face significant challenges such as replayability (Hansen, Bonsignore, Ruppel, Visconti, & Kraus, 2013), continued engagement, sustainability, (Watson, 2017), and integration into classrooms (Bonsignore, et al., 2012b; Colvert, 2009). However, the narrative-driven, cooperative, and authentic nature of ARGs and related genres have shown significant promise as a learning

environment that stands in stark contrast to the over-simplistic, decontextualized learning environment so prevalent in education today (Ito, et al., 2013; Whitton & Moseley, 2012).

Despite the increasing number of educational ARGs, designing them is a difficult task. While a significant and growing body of literature provides theoretical and practical guidance on designing educational games (Boller & Kapp, 2017; Gee, 2003; Linehan, Kirman, Lawson, & Chan, 2011; Salen, 2008), most guidance targets designers of digital games, which differ significantly from ARGs with their unique characteristics such as TINAG, transmedia interfaces, interactive storytelling run by puppet masters, etc. Existing case studies of educational ARGs, such as those cited above, have identified challenges, successes, and lessons learned from specific designs and design choices, though most studies do not address the design process itself. There are exceptions. A handful of studies examine the design process of ARGs directly. Bonsignore, et al. describe design strategies for integrating ARG characters (e.g., "protagonist by proxy") and distributed story elements into authentic learning contexts (2013). Pellicone, et al. focus on the need to consider ARGs through the lenses of gameplay, narrative, and learning (2017). Bonsignore, et al. describe which participatory design and playtesting techniques conducted with teenagers were most and least useful in the development of DUST (2016). Whitton and Moseley's edited book *Using games to enhance learning and teaching: a beginner's guide* (2012) provides strategies for ARG game designers to create low-cost games, embed learning goals and assessments, and create highly contextualized and authentic narratives. Hansen, et al. identify three different types of ARG reuse (extensibility, portability, and replayability) and provide design strategies for implementing them (2013). Waern, Montola, and Strenros illustrate design techniques that blend the real world with a fictional world through role playing and technology use (2009).

While this prior work has helped identify and articulate the key challenges and opportunities of designing ARGs, it has not been integrated into a comprehensive framework for the design of educational ARGs. The purpose of this paper is to present a framework that can be used to design and analyze educational ARGs. The Maquette framework identifies the key elements of ARGs and articulates how those elements relate to one another and to learning. We then illustrate how the framework can be used to design and analyze educational ARGs through a meta-analysis of lessons learned from evaluating 3 distinct educational ARGs that the authors developed and ran with over 4,000 players.

Maquette Framework Overview

Design frameworks are "prescriptive" in nature and "describe the characteristics that a designed artifact must have to achieve a particular set of goals in a particular context" (Edelson, 2009, pp. 114). They should ideally have a clear purpose and audience in mind. The Maquette Educational ARG Design Framework (Maquette Framework) presented here is meant to help designers **create** and **analyze** educational ARGs. The French word for "scale model," *maquette* is routinely used in architecture and the fine arts to designate a prototype of a building or sculpture (Wikipedia, Tate Gallery). In recent years, the term has been expanded to encompass preliminary models produced in a range of media and contexts, including filmmaking and video game production (Wikipedia). We draw on this more generalized sense of maquette to denote our own educational ARG design framework, which uses the visual metaphor of a tabletop game with a model game world to identify, label, and explain the foundational and supporting elements of ARGs. It is an example of a representation

of intermediate-level design knowledge (Höök, K., & Löwgren, 2012) that sits somewhere between theory and practice. It can be used generatively during the design phase to suggest the process through which design may occur and the elements and perspectives that must be considered. It does not specify which design approach to use (e.g., co-design, user-centered design, contextual inquiry), but can help ensure that key elements are considered and various elements are in harmony with one another. The framework can also be used as an analysis tool to help systematically assess and compare ARGs.

A visual representation of the Maquette framework is captured in Figure 1, which uses an analogy of a table with a model game world and game pieces resting upon it. At the base of the structure are the 4 key foundational elements represented by table legs, which support the rest of the game including the target **audience**, **learning outcomes**, **setting** (e.g., museum, library, online-only), and **TINAG**. The table itself is the **narrative theme**, which brings together the 4 elements and supports the remaining elements. The **transmedia interface** is represented by the model game world in order to convey the importance of the physical world in ARGs, although many buildings and areas in the city also represent social media, mobile, and web-based technologies. This structure was chosen because it helped illuminate the relationship between the various elements. For example, it highlights the importance of the 4 key foundation elements (i.e., the legs of the table) upon which all other elements rely and the need for them to be in harmony for a stable foundation. It also shows the bridging elements (i.e., table and model city) that are based on the 4 foundation elements, but also connect them together and serve as a further support for additional design elements.

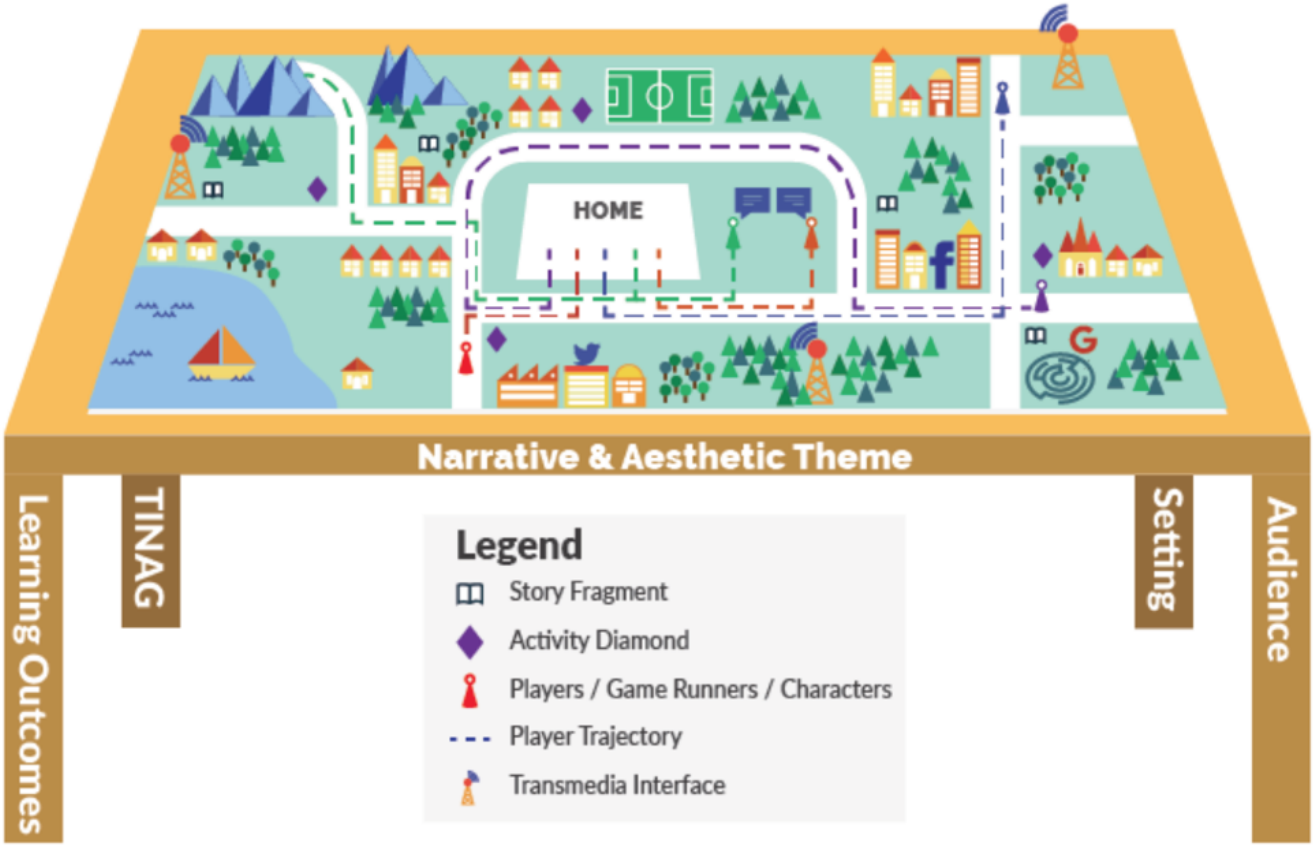

Figure 1. Maquette Design Framework Diagram

On top of the game world model rest various elements scattered throughout. **Story fragments** occur in different locations across the **transmedia interface**, which represent different social media platforms, real world locations, etc. There are also **activity diamonds** dispersed throughout that include four key cornerstones: learning activities, educational scaffolding, game mechanics, and learning goals/assessments that are integrated into a coherent whole. **Players, gamerunners, and characters** all play in the same landscape together, interacting with one another, as well as the environment, activities, and story fragments. **Player trajectories**, based on Benford, Giannachi, Koleva, & Rodden (2009) represent the unique pathways through which the player experiences the game. In fact, the network of roads and paths may be thought of as the **trajectory architecture**, which is the combination of all potential player trajectories. Though not represented in Figure 1, the **puppet masters** (also called game masters or game designers) create the various elements and helps orchestrate the gamerunners and fictional characters in a dynamic process. For example, the game masters may architect new paths and add new activities or story bits dynamically as players gravitate toward different parts of the board.

The remainder of the paper will illustrate each of these key elements of the Maquette Framework and their relationship to one another using examples from 3 ARGs designed by the authors. Insights will be shared that illustrate what to consider when looking at each element and how the framework can help in the creation process. For example, designing from the bottom upward was helpful in our own design work, since the elements at the bottom are often the most constraining, while those at the top are most flexible. The importance of certain elements in providing "creative constraints" that inspire detailed design ideas, such as the **setting** and **narrative theme** will be illustrated. Next, the paper will illustrate how the framework can be used to assess and compare educational ARGs. For example, it suggests the need to check for close alignment of learning activities with the other activity diamond points (educational scaffolding, game mechanics, and the learning goals/assessments). Additionally, it suggests techniques for assessing different player trajectories and how the experience differs for different players. It also suggests the need to consider which elements are in harmony with one another, such as the learning outcomes and the target audience.

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