Chapter 2.3
Combining Instructional Design and Game Design

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ABSTRACT

The desired outcome of instructional game design is to combine the powerful attraction of games and the proven effectiveness of instructional system design (ISD). This combination would have the capacity to focus player concentration on game play and learning the planned content in order to successfully complete the game. Conjoining game design elements (e.g., rules, goals and objectives, outcomes and feedback, conflict and challenge, interaction, representation or story) with ISD elements (e.g., analysis, design, development, implementation, evaluation) may be the means of reaching the desired outcome. Applying recent findings (e.g., working memory capacity, mental models, memory consolidation) from cognitive psychology may provide further assistance.

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INTRODUCTION

Instructional games and simulations are becoming more accepted and are in fact a popular means to enhance the learning process. Leading the movement for the utilization of digital games to boost education and training results is the American military. Prensky (2001) describes the military and its use of instructional games as a constantly changing population of over three million military and civilian personnel that requires continuous, constantly changing training. He points out that the American military is the world's biggest user of and biggest investor in digital game-based learning; its trainers are "true believers" in this learning "because it *works* for them" (p. 295) to establish a staggering variety of essential skills.

The application of games and simulations as an instructional strategy is also intriguing educational organizations, but the adoption of games by educators is growing at a slower pace. Instructional games used to enhance the teaching and learning process is not a one-size-fits-all type of approach. As for any instructional strategy used to explore a topic with a group of learners, instructional games are an effective way to enhance learning if the chosen game is adequate and conducive to the topic under consideration and if the teacher's practice of games and simulations as instructional strategy is performed naturally, with confidence, and demonstrates a comfort level that leads students to investigate the topic, using the game as vehicle and not the reason for the activities. The level of embracement necessary to adequately use instructional games is not easily found among teachers. They have preconceived ideas about games and tend to practice their use not as a primary instructional strategy but as an activity used to reward the students after the hard work that led to the completion of a project. Factors that contribute to make the adoption of instructional games less likely by the typical teacher are the difficulty in finding out how to incorporate existing games successfully, how to customize games to specific needs, and how to design and build a game when one to solve your needs cannot be located (Becker, 2005).

The creation of games and simulations in general does not follow the production flow that many products have in common. Instead, it requires the construction and development of mental models that are both novel and complex. It requires a team of specialized professionals in varied areas from artists, to software developers, to marketing specialists. There is no established set of rules that when followed will result in success. Adding an educational component to games and simulations complicates matters even further. Teachers, administrators, education-related industry, and students are in constant search to further the knowledge of the learning process in order to provide the means to facilitate and enhance it. For the learning process as well as for games and simulations there is no exact recipe for success.

Salen and Zimmerman (2004) point out that game design has not yet become a discipline of study with principles which, if followed, would result in what they call meaningful play. Meaningful play happens when the players are enabled to make rational, intentional decisions that result in actions that affect the game system. Generating meaningful play is a basic requirement of successful game design because it engages the player and induces the player to continue playing. Meaningful play is not the only element that characterizes games. Prensky (2001) proposes six elements that need to be included in digital games for them to be considered as such. A digital game must include (1) rules, (2) goals and objectives, (3) outcomes and feedback, (4) conflict or competition and challenge or opposition, (5) interaction, and (6) representation or story. Salen and Zimmerman reinforce and enrich the list by discussing and clarifying different types of rules that should be incorporated in game systems, by establishing a relationship between game objectives and player motivation, and by using game interactions to define "the space of possibility," Salen and Zimmerman's term for that virtual reality where play occurs.

To make games and simulations instructional, game designers can borrow principles from more established disciplines like instructional design, which proposes a systematic process to design instruction that is effective and efficient in facilitating learning. Dick, Carey, and Carey (2005), when introducing their detailed instructional system design (ISD) model, mention that there are many other models for ISD practice but the ADDIE model is included as a common element

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