Introduction

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I am thrilled to introduce this brand new book series, *Learning, Education and Games*, which examines the latest research and design techniques for creating and using games for learning. This is the first book in a two-book series, which was written, edited, and reviewed by members of the Learning, Education and Games (LEG) Special Interest Group (SIG), a subset of the International Game Developers Association (IGDA).

But first, let us take a step back. Is there even a connection between games and learning? Popular opinion and mainstream media seem to suggest that games, if anything, are the antithesis to learning. On the other hand, my experiences during the past decade have repeatedly reminded me how much learning and games are interconnected. I observed how the power of play helps us experiment with new identities, safely explore choices and consequences, and push the boundaries of a system. I experienced how games provide access to new worlds and alternate systems of values, past moments of history, and social interaction with people from diverse cultures, perspectives, and experiences. I saw how games could situate learning in authentic contexts, such as environmental disaster zones for science learning, physical battle sites for history learning, foreign countries for language learning, or even in real texts for literature and literacy learning. Essential skills—from math facts acquisition to vocabulary building to civic literacy—could be taught through games, if the games were properly designed. The potential for teaching complex thinking skills—such as creativity and innovation, ethical thinking, design and problem solving, systems thinking, and computational understanding—also seem to be suggested by burgeoning research.

On the flip side, we know there are limits to what any game can do, just like any educational program, process, or activity. One game may fit a particular pedagogical need, audience, and set of goals and constraints, while the same game could be inappropriate in a different context. One game may support certain learning styles or skill needs, but not others. Just as the potentials of games for learning have

been suggested, the limits also need to be identified. We need to not only understand whether a game can teach, but the conditions under which it can (or cannot) help someone learn.

Assessing the efficacy of games in support of the acquisition and long-term practice of skills and concepts in games has shown to be challenging. While assessing other types of educational interventions and programs is often tricky, games—and their many factors, ecologies, and contexts—may confound us even further. Despite these challenges, in the past decade or so, the attention to and research of games and learning has blossomed exponentially.

Likewise, there has been an increase in the creation and use of learning games in classrooms and informal education sites (e.g., afterschool, libraries, home), as well as a growth in the number of websites, applications, and other media devoted to educational games. With the advent of more accessible and open game tools, engines, and platforms, there is also an emerging indie scene of educational game makers.

Games and gaming for learning have also crept into unexpected corners—from the government to the workplace, hospitals and doctor's offices, and the military. Although the term gamification has been bandied about more recently to discuss games being used in not-typically-game contexts, people have been trying to design powerful and engaging experiences using good games for years. While espousing the pros and cons of "gamification" is not the focus of this book series, the fact that the use of this term has increased so rapidly (though perhaps in misaligned contexts), further suggests a need to reevaluate the intersection of games and learning.

Despite all of the technological, social, and economic innovations that have allowed us to create, play, iterate on, replicate, and research digital games, we also cannot overlook the many forms games can take. Games—whether digital, hybrid, virtual, analog, online, offline, console, web-based, text-based, graphics-intensive, or mobile—are, at their core, games. Human beings have been playing games, and learning from games, since the start of humankind. We cannot forget that games are, at their essence, about sharing and communicating truths about ourselves. And, if you play a game, no matter what you have learned *something*—which is, at the very least, how to play the game.

For these reasons, it is an appropriate juncture to pause and consider the state of learning, education and games. The mission of this book series is to articulate the limits and potentials of games for learning, to identify the best practices, exemplars, and case studies, and to explore what remains to be examined. Educators, school policymakers, parents, and designers struggle to understand better ways to develop and use games for learning and education. With this book, we seek to empower these audiences to understand the primary theories, latest research findings, and best practices, and use this knowledge to better design and integrate games into their homes, classrooms, districts, libraries, afterschool centers, day cares, workplaces, and museums.

Please note that this book series will describe the potential and limits of games to foster learning—but will not examine whether games are inherently good or bad, nor will it consider popularly discussed issues that could be counter to learning, such as game addiction, violence, or diminished physical activity. This book seeks to be a thoughtful and conversational approach to a burgeoning and complex field, so as to inform future design, policies, standards, curricula, and products. Additionally, we will try to steer away from defining games for learning and education with a snazzy term or acronym, such as those used in the past (e.g., edutainment, edugames). Instead, we will make the assumption that this book covers any game that is primarily designed or used for learning and education—even if it is (as it should be) also designed for fun, engagement, meaningfulness and/or entertainment.

Finally, this book will also cover games whose primary use is not that of learning. For example, mainstream, commercial off-the-shelf games (even controversial ones such as the *Grand Theft Auto* or *Call of Duty* series) can potentially be modified, altered, recontextualized, or reflected upon for educational purposes. That said, we agree that there are a ton of poorly designed and inadequately implemented educational games out there (and there are also bad games of all ilk and purpose). Instead of merely critiquing their existence, we hope that the theories, practices, and approaches described in this book will help to constructively change their use and design.

How To Use This Book

This first volume of this series on learning, education and games is divided into two main sections. The first section focuses on curricular considerations and dives into a number of disciplines and relevant design and research frameworks, techniques, and practices. This section includes chapters on STEM (science, technology, engineering and mathematics), computational thinking, history and social studies, literacy, music, physical education, emotional health, ethics, and 21st century skills. While these are not the only topics covered in school and informal educational outlets, they are an initial stab at unraveling the intricacies of teaching particular skill sets and themes through games.

The second section covers primary design and assessment considerations, and concentrates on illustrating game design techniques in relation to educational needs. While designing games is always a complex process, designing for educational purposes adds another layer of complexity, which we try to tease out in this section. In particular, we provide an overview of the methods of designing educational games, as well as narrow in on a few relevant topics such as defining goals and targeting an audience. We also cover techniques for playtesting and iterative design, as well as education assessment methodologies and practices as applied to games and game design.

Each individual chapter is divided into a number of segments, including the:

1. **Introduction**, which covers the major questions and terms related to the topic;
2. **Key Frameworks**, which introduces the primary theoretical frameworks for the use, design and evaluation of games for learning;
3. **Key Findings**, which relays the major recent findings in the field;
4. **Assessment Considerations**, which discusses specific assessment challenges or opportunities;
5. **Future Needs**, which lays out the open questions and gaps in research or application;
6. **Best Practices**, which summarizes the key takeaways and most effective techniques and findings.

Each chapter also includes two to four **case studies** to illustrate the theories and findings in practice. You can read the case studies individually or in the context of the chapter. Every chapter also provides a list of useful **resources** and relevant further reading (and gaming!).

In the next volume, we will focus on classroom, audience, and other contextual considerations as they relate to designing, using, and evaluating learning, education and games.