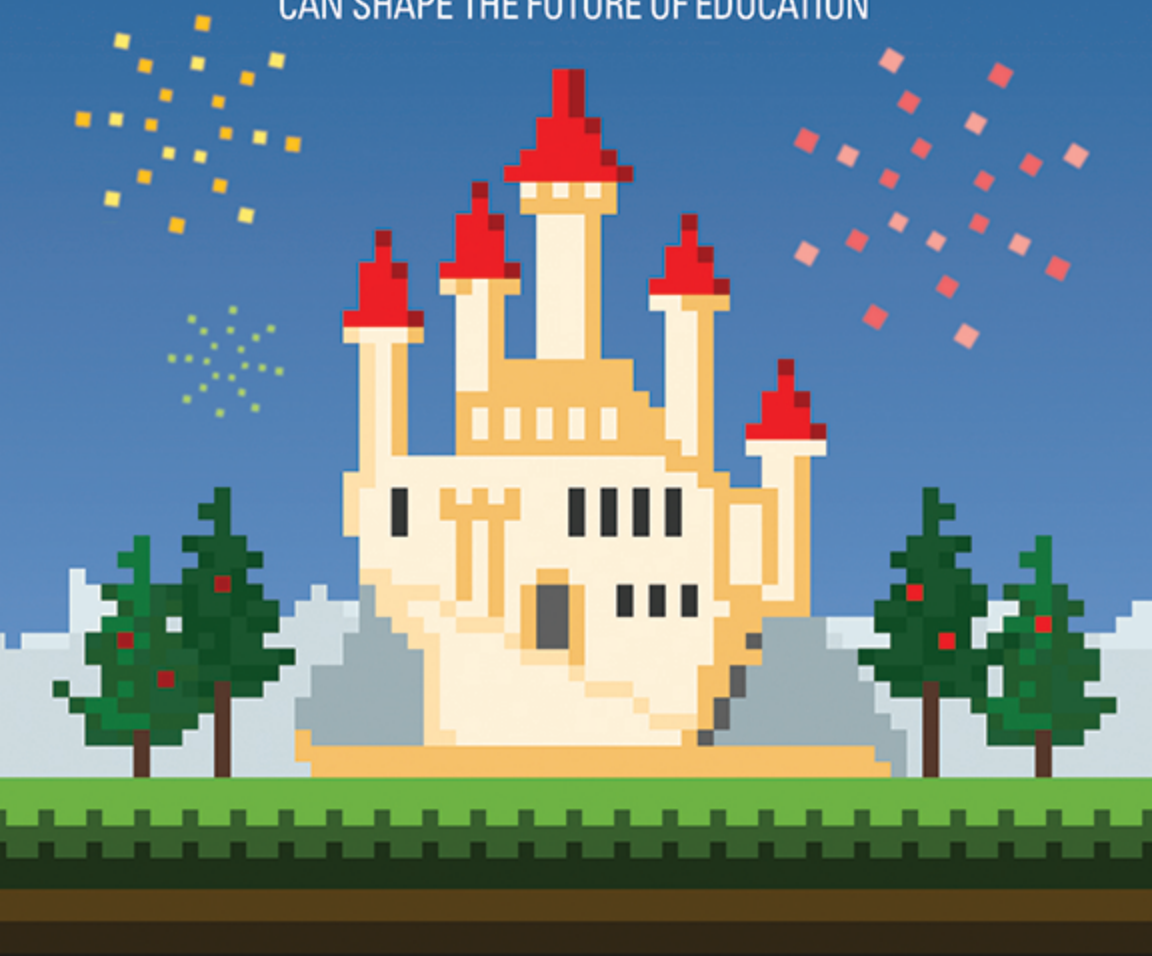
PSYCHOLOGICAL PERSPECTIVES ON CONTEMPORARY EDUCATIONAL ISSUES

EXPLODING THE CASTLE

RETHINKING HOW VIDEO GAMES & GAME MECHANICS CAN SHAPE THE FUTURE OF EDUCATION



EDITED BY

MICHAEL F. YOUNG & STEPHEN T. SLOTA

Exploding the Castle

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CONTENTS

Foreword ix

Preface xi

KI

INTRODUCTION

1 Castle Upon a Hill 3
Michael F. Young and Stephen T. Slota

2 What Homeric Epic Can Teach Us About Educational Affordances of Interactive Narrative 19
Roger Travis

3 Structures of Play: Literacy, Games, and Creative Writing 39
W. Trent Hergenrader

SHŌ

DEVELOPMENT

4 The Role of Digital Games in a Classroom Ecology: Exploring Instruction With Video Games 67
Amanda Bell and Melissa Gresalfi

5 More Than an Avatar: Unmasking the Player's Impact on an Educational Game 93
Jackie Barnes and Melissa Gresalfi

6 Ask Not What You Can Do for Badges; Ask What Badges Can Do for You 117
Peter Samuelson Wardrip and Samuel Abramovich

7 An Ecocentric Framework for Game-Enabled Impact: Lessons Learned From the Quest2Teach Project 139
Sasha Barab and Anna Arici

8 Educating Digital Natives: Possible and Prospective Futures of Students in Learning Ecologies 179
W. Ian O'Byrne and Nenad Radakovic

TEN

TWIST

9 Measuring and Supporting Learning in Educational Games 201
Valerie J. Shute, Seyedahmad Rahimi, and Chen Sun

10 Situating Big Data 221
Jennifer Dalsen, Craig G. Anderson, Kurt Squire, and Constance Steinkuehler

KETSU

CONCLUSION

11 Distributed Teaching and Learning Systems in the Wild 253
Jeffrey B. Holmes, Kelly M. Tran, and Elisabeth R. Gee

12 The Inevitability of Epic Fail: Exploding the Castle With Situated Learning 271
Stephen T. Slota and Michael F. Young

About the Editors 285

FOREWORD

Certain technologies have had magical effects. They have utterly changed the world. Writing turned language—a creature of sound rapidly decaying in time—into a creature of visual images fixed in space. Writing made meaning permanent, inspectable, public, and able to travel great distances. It gave rise to logic, libraries, science, and the state. The telegraph and its heirs collapsed time and space. The world shrank and humans became one big discourse community interacting in real time. The washing machine freed half the human race (women) in the developed world to work and thereby created modern economies. New technologies to clean water will free the same half in the developing world to go to school and work, instead of traveling long distances each day to hydrate. Computers have changed the very nature of work, and—combined with the Internet—they are well on the way to creating a nearly jobless future.

Any powerful technology can do good, evil, or nothing depending on how, when, and where it is used. Books have led to great things, indeed. Nonetheless, millions and millions of lives have been lost because someone read a book (e.g., the Bible, the Koran, or *The Turner Diaries*) and thought it was telling them to kill other people. And, of course, many people think God wrote a book; they just don't agree which one. Literacy is truly powerful.

The jury is still out on video games. They are too new and are changing too fast and furiously for us to know much yet about how powerful they will be. For now, there are very few people who think a video game told them to go on a murderous crusade, and no one thinks God designed a video game (leaving aside the small number of people, like me, who think Will Wright is God).

Exploding the Castle, pages ix–x

But video games have the *potential* to be as important (for good *and* bad) as writing, the telegraph, washing machines, and water nanofilters. Human beings are built in such a way—it is part of our human nature as it has evolved—to learn best only under certain (and rather narrow) conditions. These conditions are socially interactive and collaborative immersion in well-designed and well-mentored embodied experiences of problem solving where the cost of failure is greatly lowered. This is how language acquisition works and how socialization and enculturation work whether in a family, culture, or profession.

For centuries, we humans have been constrained in the creation of such learning experiences by the limitations of—and grave dangers in—the real world and by the limitations of our human senses and our middling (not to say piddling) size (we are way too big to see and do some things, like play with electrons, and way too little to see and do others, like jump from solar system to solar system). But video games have the potential to transform these limitations.

Video games can allow us to create brand new worlds and embody our bodies and minds in them via surrogate bodies (avatars). They can immerse us in experiences no human has ever had before in history. And, in the words of an ad for the first *Portal* game, they can change the way we humans "approach, manipulate, and surmise the possibilities in a given environment" (STEAM, 2007, n.p.). The world today is a royal jumble of interacting, nearly out-of-control complex systems set awry by utter human stupidity. We had better surmise some new possibilities—and soon.

So, let us explode the castle and shape the future, by all means. A lot is at stake in this excellent collection aiming to test and expand the limits of video games and learning.

—James Paul Gee
Arizona State University

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STEAM. (2007). *Portal* [video clip]. Retrieved from http://store.steampowered.com/app/400/

PREFACE

When we first started investigating game-based teaching and learning in 2009—known at the time as "gamification" or "serious gaming"—we figured it would be fun but nevertheless more of the same old thing. After all, we'd studied multimedia software, web quests, and programmable robots before, and nothing about video games (as a technology) struck us as terribly unique or complex. But, in the span of about six months, the relatively straightforward research trajectory we originally planned to follow turned into something quite different.

We knew then (and have argued passionately since) that quality games research starts with understanding *how* and *why* players play games. Unfortunately for educators and scientists, gameplay changes from day to day, quest to quest, and even from one battle to the next. When individual goals for play change, the nature of the gaming experience changes; likewise, when the gaming experience changes, the potential for various academic benefits changes. Individuals playing *World of Warcraft* as a Gnome Warrior may choose to max out their engineering skill in part due to a parallel interest in real world chemistry and physics. But when those same individuals engage in player-versus-player battle, they will modify their behavior to fulfill new goals that rely on collaborative problem solving and self-regulation (i.e., 21st-century digital work and learning skills) rather than chemistry- or physics-based thinking. Such in-the-moment, on-the-fly adaptations are logical and reasonable (Why waste time and energy on skills that aren't pertinent to the immediate situation?) but make it incredibly difficult to reduce variables like engagement, motivation, and achievement across time and

Exploding the Castle, pages xi–xiv

individuals, as traditional t-tests in educational research require. That made us wonder: Do players recognize when their goals shift during play? If they do, do they recognize when, why, and how it occurs? What happens when player goals misalign with designer goals? And, perhaps most importantly, will the answers to these questions ever enable us to answer broad questions such as whether games are "good" or "bad" for education?

Initial attempts at examining these big "how" and "why" questions led us to realize that traditional educational research strategies would only ever lead to mixed and uninterpretable results as different players played their games for different reasons across time. That meant our idyllic "castle upon a hill"—the one containing our game-based learning princess (i.e., our understanding of games as an instructional resource)—was probably much further off in the distance (and in greater disrepair) than we thought.

That's why, in October 2015, we invited a number of leading games scholars to collaborate on an edited volume as a means of "resetting" our collective approach to games research. Doing so meant replacing traditional studies with situated analyses aimed at answering newly revised, more granular questions like, "What does the wise integration of games into classrooms actually look like in practice?" and "How can we evaluate the value-added nature of various game mechanics and components if they can't be standardized and administered to students like prescription medication?"

This book is the fruit of our effort.

As you'll see, we have taken a holistic approach to educational gaming. Some of our contributing authors focused on video games, while others focused on text-based games and other forms of play. Some focused on assessment, and others focused on teaching practice or how theory can inform design. Naturally, this gives us quite a bit of complex content to unpack, but we've tried to make it as accessible as possible for any educator, administrator, researcher, designer, or gamer with a general interest in game-based instruction.

Additionally, given our penchant for using princess/castle/plumber-themed analogies, we've decided to organize our thoughts using the classic Chinese, Japanese, and Korean story structure *kishōtenketsu* (起承転結), a Nintendo favorite when it comes to designing stages, mechanics, and player goals for the *Super Mario* series. In *kishōtenketsu*, the overarching narrative is broken into four parts:

1. Introduction (*ki*): Introduces the story's setting and main characters.
2. Development (*shō*): Follows from the introduction, develops the story, and leads to a twist.
3. Turn/Twist (*ten*): Brings the story in a new direction that includes the climax (*yama* ヤマ).

4. Conclusion (*ketsu*): Ties together story threads to provide a cohesive ending (*ochi* 落ち).

Our *ki* opens with an anchor chapter that explains why we so intensely believe games are unique learning ecologies with potentially powerful instructional affordances. This sets up our major "characters," games and their affordances, for Roger Travis to elaborate on in Chapter 2. Through his contribution, we discover that game-based teaching and learning are as old as the art of storytelling and why Socrates (yes, *that* Socrates) should be considered the very first "gamer." In Chapter 3, Trent Hergenrader expands on Travis' storytelling-as-play by exploring how the overlapping features of games and other media can be used to guide creative writing instruction and practice, especially with respect to narrative world-building.

Next, opening our *shō*, Amanda Bell and Melissa Gresalfi address the need for classroom and technology supports capable of helping teachers successfully incorporate video games as part of their standard instructional practice. Jackie Barnes and Melissa Gresalfi take this a step further in Chapter 5 by exploring case study evidence to help us understand whether children playing games in school view and play them like the games they play at home or if they view and play them like other school activities (e.g., worksheets, tests). Their work raises important questions about whether and how we should use games to tackle assessment, which serves as the focal point for Peter Wardrip and Sam Abramovich's Chapter 6 on badging systems. Chapter 7, penned by Sasha Barab and Anna Arici, broadens the assessment scope to include data-rich activities that take place outside of play (i.e., the meta-game), like visiting cheat/hint sites, discussing game play online/in-person, and extending game narratives by writing fan fiction.

Of course, to understand games' educational potential, researchers must also understand that play is only one piece of the gaming experience. That's why our *ten* begins with Ian O'Byrne and Nenad Radakovic's Chapter 8, which utilizes a series of future studies to orient us toward our end goal, the construction of a "castle" where games research is situated in a rich, dynamic learning ecology. Meeting that goal, according to our Chapter 9 authors Valerie Shute, Seyedahmad Rahimi, and Chen Sun, hinges on our understanding of testing in game-based learning environments. Like O'Byrne and Radakovic, they explore a possible game-infused future but emphasize the benefits and implementation strategies associated with "stealth assessments," activities or tasks embedded into games as a means of tracking longitudinal student growth and achievement. In Chapter 10, Jennifer Dalsen, Craig Anderson, Kurt Squire, and Constance Steinkuehler bring us deeper by discussing the "data exhaust" that flows out to teachers and researchers via game

and learning analytics, from a player's first key press, chat post, and menu decision to their last.

Finally, we reach the *ketsu*, where we synthesize our findings into recommendations aimed at helping teachers, designers, and learning scientists improve their game-based instruction and research. This includes our Chapter 11 contributors—Jeffrey Holmes, Kelly Tran, and Elisabeth Gee—sharing a study of distributed teaching and learning systems to optimize game-based instruction, and our volume editors—Stephen Slota and Michael Young—deconstructing a series of educational technology projects to pinpoint why and how we should replace the game-based learning "castle" as it currently exists with one grounded in situated cognition.

It's our hope that this book will convince you of the instructional potential inherent in the treatment of games as learning ecologies. We know, as with any good boss fight, one attempt may not be enough, but that's why we're glad to have an audience as vested in game-based education as we are. With your help, this work can and will continue. The more teachers, researchers, and game players who join the cause, the closer we'll come to understanding how and why students learn through play. And, given enough time and attention informed by high-quality research, we're confident that the games community will be able to create greatly improved game-based instructional tools for 21st century education.

Thank you so much for joining us on this adventure.

—Stephen T. Slota
Michael F. Young