

Contents

1 Introduction	1
1.1 The Challenge of Learning Games	3
1.2 Before Proceeding: A Couple of Cautions.....	4
1.3 The Work of Designing a Learning Game	6
1.3.1 Still Excited?.....	6
1.4 Speaking of the Lifeworld: Who Are These People Writing at Us?.....	7
1.5 What Will We Cover?.....	8
1.5.1 You May Experience Loss	9
1.6 Sounds Complicated: How Will You Specifically Explain All of This?	10
1.7 Lessons from Our Experience.....	11
1.7.1 Learn from Our Mistakes.....	11
References.....	12

Part I Before Learning with Games: What Are They, Where Do They Come From, Should I Use or Design Them, and How Can I Start From an Ethical Mindset?

2 What Is (and Is Not) a Learning Game?	15
2.1 What's in a Name? Defining Games.....	16
2.1.1 The Media vs. Method Issue.....	16
2.2 How We Define a Learning Game and Why.....	17
2.3 What and Why Simulation?.....	17
2.3.1 Jean Baudrillard: The Virtual Is Real.....	19
2.3.2 Example of Teaching with an Inquiry Simulation Experience	20
2.4 So What the Heck Is a Game?	22
2.4.1 How Has "Game" Been Used Generally in Entertainment and How Are They Defined?.....	23
References.....	25

- 3 Why and How Can Games Influence Learning? 27**
 - 3.1 Learning Theories in the Context of Philosophy, Education, and Games 28
 - 3.1.1 A Little General Philosophy 28
 - 3.2 How We Learn from What Games Communicate: A Personal Example..... 36
 - 3.2.1 Communicating Basic Information, Simply 37
 - 3.3 Games as Literature: Connecting Narrative Game Experiences to Literacy 39
 - 3.3.1 Overcoming the “Games Are Bad for Kids” Problem from the 1980s 40
 - 3.3.2 Meta-thematic Literature Connections 41
 - 3.3.3 The Role of Narrative to Drive Play 42
 - 3.4 How Computer-Mediated Communication Works for Learning with Something You May Know Better: The Learning Management System 43
 - 3.4.1 Why the Graphical Quality of Your LMS Does Not Really Matter, but Fidelity and Accurate Modeling of Content and Experience Does, Not Just in Learning Games 45
 - 3.5 Simulation and Learning: How the Approximation and the Real Relate 45
 - 3.5.1 Human Arrogance and the Issue of Information vs. Knowledge 46
 - 3.5.2 Digital Simulations for Building Knowledge 47
 - 3.5.3 Dual Coding and Why Might Media Used to Design Games Stimulate Learning 49
 - 3.6 The Confounding Factors of Learning Games Must Be Acknowledged..... 49
 - 3.7 The Use of Multiple Mediums as a Gestalt Is a Platform Not “Media” 51
 - References 51
- 4 Ethical Challenges to the Design and Study of Learning Games 55**
 - 4.1 An Ethical Mindset: Before Design Begins 56
 - 4.2 Ethical Considerations with Learning Games and Simulations..... 58
 - 4.3 Games That Produce Poor Learning Results Are a Problem 60
 - 4.4 The Final Calculation: Our Ethical Obligation to Do No Harm..... 61
 - 4.5 The Need for Critique Learning Games: What They Explicitly and Not-So-Explicitly Teach..... 61
 - 4.5.1 A Few Critiques of Using the Civilization Series for Learning and Teaching 63
 - References 66

- 5 Should I Really Use or Design a Learning Game?**..... 67
 - 5.1 Determining Whether to Design Learning Game 68
 - 5.2 Topic: What Is the Lesson All About? 68
 - 5.3 Audience(s): Student and Teacher 69
 - 5.4 Purpose: What Is My Goal and Outcome(s) with Using
the Learning Game? 70
 - 5.5 Format: Is the Game Structure Appropriate to the Content
and Learners? 71
 - 5.6 Evidence-Based Decision: What Does the Research Say? 71
 - 5.7 Matching Game to Outcome: What Is the Expected
Benefit to Learners? 72
 - References 73
- 6 Some Tools for Learning Game Design: Game Engines,
Virtual Worlds, and Transmedia** 75
 - 6.1 What Are Virtual World Environments? 75
 - 6.1.1 ActiveWorlds, a Simulated 3-D Web Browser..... 76
 - 6.1.2 *Second Life* for Learning Game Design..... 77
 - 6.1.3 Transmedia for Learning Game Design..... 77
 - References 78
- Part I Summary**..... 81
- Part II Approaches to and Examples of Learning Game Design**
- 7 Three Approaches to Designing Games for Learners**..... 85
 - 7.1 The Civilization Method 86
 - 7.2 The Gamification Method 88
 - 7.3 The Math Blaster Technique 89
 - 7.4 Our Learning Game Design Approach: The Middle Way..... 91
 - 7.4.1 Front-End Analysis 91
 - 7.4.2 Start Design by Stating the Instructional
and Learning Objectives 92
 - 7.4.3 Identify Game Elements to Motivate Learning..... 93
 - 7.4.4 Evaluate the Potential Delivery Mechanisms/
Game Systems/Game Engines 93
 - 7.5 Designing the Learning Game Activities 94
 - 7.5.1 Step A: Create a List of Actions 95
 - 7.5.2 Step B: Identify the Core Rules 95
 - 7.5.3 Step C: Determine the Entry Level of Your Expected
User/Learner 96
 - 7.5.4 Step D: In-Game Decision Making..... 96
 - 7.5.5 Step E: Develop Your Narrative Context 97
 - 7.5.6 Step F: Develop Your First Prototype 98

7.5.7	Step G: Play It Yourself.....	98
7.5.8	Step H: Analog Usability/Play Test Before Digital Development	98
7.5.9	Step I: Develop the First 20 % of the Game	99
7.5.10	Step J: Initial Digital Usability/Play Test.....	99
7.5.11	Step K: Use the Usability Reports	100
7.5.12	Step L: Revision of Play/Learning Activities.....	101
7.5.13	Step M: Create the Next Iteration	101
7.5.14	Step N: Polish Your Game.....	101
7.5.15	Step O: Polish It Some More	101
7.5.16	Step P: Polish Until It Shines	102
7.5.17	Step O: Full Beta Test	102
7.5.18	Step P: Revise and Release	102
7.5.19	Step Q: Polish and Patch	102
7.6	Transmedia Game Design.....	103
7.7	Conclusion	103
	References.....	103
8	<i>Anytown: A Literacy Game and Its Background</i>	105
8.1	Quest Atlantis: Where We Built the Game, Meta-narrative, and Fun.....	106
8.1.1	Narrative Basis for QA.....	106
8.1.2	The Basic QA Narrative in <i>Archfall</i> and <i>Shardflower</i>	107
8.1.3	Learning Through Questing	110
8.2	Why Build Anytown?.....	111
8.2.1	Background on the Designers to Explain Why a Writing Game Instead of a Science One	112
8.2.2	Why a Designer's Background Matters and How It Influences What We Choose to Build.....	113
8.2.3	Other Developments That Influenced the Shape of Anytown.....	113
8.2.4	Why Talk About Some of These Things Again?.....	115
	References.....	115
9	The Core <i>Anytown</i> Design and Development Process	117
9.1	Why ADDIE When There Are So Many Instructional Design Models?	117
9.2	<i>Anytown</i> Analysis.....	118
9.2.1	<i>Anytown</i> (A)nalysis Phases	119
9.2.2	<i>Anytown</i> Design Process	119
9.2.3	<i>Anytown</i> Story Framing.....	120
9.3	Managing a Creative Design Process.....	124
9.4	Writing Improvement Expected from Increased Time on Task, Not the Game.....	124

9.5	How Anytown Was Expected to Support Writing Improvement ...	125
9.5.1	First: Gaining Prerequisite Knowledge and Skills Through the Senses and Experience	126
9.5.2	Second: Social Constructivism as a Means to Construct Knowledge and Help Kids Solve Problems	127
	References	131
10	Media, Method, and <i>Anytown's</i> Instructional Design	133
10.1	Technology Limitations and Affordances	134
10.1.1	Challenges with Writing Learning Activities Due to Back-End Programming	135
10.1.2	Limited Options for Technology Development	135
10.2	What Made <i>Anytown</i> a Learning Game?	136
10.3	Why You Need a Developer's "Bible"	138
10.3.1	The Importance of the Organizational Scheme to Your Design	139
10.4	The <i>Anytown</i> Narrative Development Concurrent to 3-D and Scripting Development	142
10.4.1	Engineering the Learning Activities	142
10.4.2	Writing Practice Activities	146
10.4.3	Adventure Game Play Activities	147
10.4.4	Creative Writing Quests for Voluntary Practice and Divergent Activities	148
10.5	Splitting Up the Work of Building the Game to Improve Efficiency	148
10.6	<i>Anytown</i> as Simulation	148
10.6.1	Why We Tried to Make the Non-player Characters Simulate Real People	149
10.6.2	Writing the <i>Anytown</i> in a Safe Space: Learning Game Producer Role Versus Everyone Else	149
10.6.3	Problems of Textual Construction Stemming from a Lack of Tacit Knowledge on the Part of Designers of K-12 Instructional Treatments Like Games: A Long Way of Saying that We Need to Approach Learning Game Design from a Position of Humility and Service to Others	151
	References	152
11	Lessons from <i>Anytown</i>	153
11.1	Positive Instructional Outcomes	153
11.1.1	Increased Writing Skills	154
11.2	Challenges with the Design	155
11.2.1	Not Enough Time to Get to the Most Engaging Activities	155
11.2.2	Too Many Researchers, Too Much Equipment in the Lab	156

- 11.3 Challenges to Implementing Anytown as a Game 156
 - 11.3.1 Training the Teacher to Use Anytown..... 157
 - 11.3.2 Training the Students to Use QA 157
- 11.4 What We Learned for Future Games from the Anytown Experience..... 158
 - 11.4.1 Lesson 1, Spend as Much Time with Your Intended Audience Before Design: User Analysis..... 158
 - 11.4.2 Design-Phase Lessons..... 159
 - 11.4.3 Lesson: Design for Only 25–30 h of Total Play If Intended for Lab Use..... 160
 - 11.4.4 Ensure Your Game Matches the Actual Worldview of the Teacher, Not What They Report 160
 - 11.4.5 Focus on a Narrow Age Range and “Go Native” 161
- 11.5 Conclusion 162
- References 163
- 12 Chalk House: Trying Again Using the Lessons of Anytown..... 165**
 - 12.1 Mistakes Were Made..... 165
 - 12.2 Building *Chalk House*..... 166
 - 12.2.1 Origin of the Narrative 167
 - 12.2.2 Academic Purposes with Chalk House 167
 - 12.2.3 Blending Old and New Technologies and Research..... 168
 - 12.2.4 Shifting from Construction in *Anytown* to Knowledge Acquisition in *Chalk House*..... 169
 - 12.2.5 Blending Game and Assessment..... 170
 - 12.3 The Role of 3-D for *Chalk House*: Explaining Why We Did Differently than in *Anytown*..... 170
 - 12.3.1 Dealing with the Social Constructivist/Problem-Based Learning Problem..... 171
 - 12.4 Intelligent Pedagogical Agents in *Chalk House*..... 172
 - 12.4.1 Directed Instructional Narrative Delivered with Help from Intelligent Agents 173
 - 12.5 The *Chalk House* Learning Design..... 174
 - 12.5.1 Learning Tasks and Writing Driven by the Game System 174
 - 12.5.2 Step Writing Process to Guide Descriptive Writing 176
 - 12.6 Conclusion 177
 - References 178
- Part II Conclusion..... 181**
- Part III Transmedia Learning Games**
- 13 Accidental Transmedia Design with *The Door*: Designing an Undergraduate Computer Literacy Course Experience..... 185**
 - 13.1 Our First Transmedia Course Game: Building The Door..... 187
 - 13.1.1 Discovering the Alternate Reality Game Genre 187

13.2	Aligning PBL Theory and Game Principles to Build <i>The Door</i>	188
13.2.1	Tenet 1: Anchor Learning Activities Within a Larger Problem.....	188
13.2.2	Tenet 2: Help Foster Learner Personal Development and Task Ownership.....	189
13.2.3	Tenet 3: Design Authentic Learning and Play Tasks	191
13.2.4	Tenet 4: Design Tasks and Game to Reflect the Complexity of the Future Work Environment.....	192
13.2.5	Tenet 5: Give the Learner Process Ownership When Developing a Solution	193
13.2.6	Tenet 6: Design Game Tasks and Play to Both Support and Challenge the Mental Models.....	193
13.2.7	Tenet 7: Encourage Testing Ideas Against Alternative Views and Alternative Contexts	194
13.2.8	Tenet 8: Support Learner Reflection on Both the Content Learned and the Learning Process.....	196
13.3	Conclusion	196
	References	196
14	Teaching Computer Literacy with Transmedia Designed by Learners with <i>Broken Window</i>	199
14.1	Theoretical Models Supporting Broken Window	199
14.2	Communicative Actions and the Design of <i>Broken Window</i>	201
14.2.1	The <i>Broken Window</i> Narrative Approach.....	202
14.2.2	Engineering the Activities in <i>Broken Window</i>	203
14.3	Developing the Instructional Conflict to Design Learning and Play	207
14.3.1	Ill-Structured Problems to Drive Learning	208
14.4	Contextualizing Play Through the <i>Broken Window</i> Story.....	210
14.4.1	Starting Learning and Play Using a Rabbit Hole.....	210
14.4.2	Character Interactions to Drive Play	212
14.4.3	The Puppet Master	213
14.4.4	The Clients Used as Pedagogical Agents to Pose and Scaffold Problems.....	214
14.4.5	Using Commercial Tools to Provide Additional Depth of Context and Play.....	215
14.4.6	The Importance of the Instructor Job Aid	215
14.5	Assessing Successful Student Learning Delivered Through Transmedia Play	217
14.6	Conclusion	217
	References	219
Part III	Conclusion	221

Part IV Studying Learning Games and Where Do We Go Now?

15	The Study of Learning Games	225
15.1	General Approaches and Thoughts Related to Studying Learning Games	227
15.1.1	Addressing Learning Game Research and Why It Is Centrally Important to Our Endeavor.....	229
15.2	Qualitative Research Methods for Learning Game Study	232
15.2.1	Qualitative Data Collection Approaches with Learning Games.....	232
15.2.2	Qualitative Analytical Approaches.....	235
15.3	The Mixed Method Research Approach	236
15.4	Comparison Studies	236
15.5	Data Mapping and Player Use Tracking	237
15.6	Evaluating Training for Learning Games and Simulations.....	237
15.6.1	Learning Game Professional Development Criteria	238
15.6.2	Gathering Data in a Learning Game Professional Development Implementation.....	238
15.6.3	Problems in the Alignment of Game and Audience Emerging from the Training	239
15.6.4	Challenges in the Professional Development Itself	240
15.7	Evaluating Player-Only Training	241
15.8	Evaluating a Learning Game Implementation	242
15.8.1	Evaluating the Game Narrative.....	243
15.8.2	Usability	243
15.8.3	Evaluating the Alignment of Goals, Objectives, Criteria, Learning Activities, and Assessments	244
15.8.4	Evaluating the Specific Learning Activities in Analog Isolation.....	244
15.8.5	Evaluating Impact on Higher-Order Thinking Skills.....	245
15.8.6	Evaluating Impact on Test Scores	245
15.8.7	Evaluating Your Product Based on Simpler Criteria First When Scaling.....	246
15.8.8	Evaluating the Overall Experience	247
15.9	Writing Up Your Learning Game Findings	247
	References	248
16	Conclusion	251
	References	255
	Index	257