Contents

List of Figures and Tables  xii
Contents on the Web  xv
Foreword by Kevin Kruse  xvii
Preface  xxi
Acknowledgments  xxvii
About the Author  xxix
Contributors  xxxi

Chapter 1  What Is Gamification?  1

Chapter Questions  1
Introduction  2
Gamification in Action  2
What Is a Game?  6
What Is Gamification?  9
What Gamification Is Not  12
Gamification Versus Serious Games  15
Growth of Gamification  18
Who Is Using Gamification  19
Implications and Importance to the Future of Learning  22
Key Takeaways  23

Chapter 2  It's in the Game: Understanding Game Elements  25

Chapter Questions  25
Introduction  26
Abstractions of Concepts and Reality  26
Goals  28
Rules  29
Conflict, Competition, or Cooperation  31
Time  32
Reward Structures  33
Feedback  35
Levels  37
Storytelling  41
Curve of Interest  45
Aesthetics  46
Replay or Do Over  48
Implications and Importance to the Future of Learning  49
Key Takeaways  50

Chapter 3  Theories Behind Gamification of Learning and Instruction  51

Chapter Questions  51
Introduction  51
Contents

Motivation 52
The Taxonomy of Intrinsic Motivation 58
Self-Determination Theory 63
Distributed Practice 65
Scaffolding 66
Episodic Memory 67
Cognitive Apprenticeship 69
Social Learning Theory 70
Flow 71
Key Takeaways 74

Chapter 4  Research Says . . . Games Are Effective for Learning 75
Chapter Questions 75
Introduction 76
Game Research 76
Randel’s Meta-Analysis 77
Wolfe’s Meta-Analysis 80
Hays’ Meta-Analysis 80
Vogel’s Meta-Analysis 82
Ke’s Qualitative Meta-Analysis 83
Sitzmann’s Meta-Analysis 85
Elements of Games 88
Key Takeaways 101

Chapter 5  Leveling Up: What Gamification Can Do 105
Chapter Questions 105
Introduction 106
Improving Surgeon Hand-Eye Coordination 106
Solving Problems 108
Teaching Higher Order Skills 110
Thinking the Unthinkable 112
Thinking Like Your Opponent 113
Engaging Learners in a Live Classroom 115
Helping People Lose Weight 116
Making Physical Therapy More Enjoyable 119
Influencing Pro-Social Behavior 119
Testing Knowledge and Performance 123
Good for Young and Old 125
Key Takeaways 126

Chapter 6  Achiever or Killer? Player Types and Game Patterns  127

Chapter Questions 127
Introduction 128
Types of Play 128
Player Skill Levels 131
Bartle’s Player Types 132
Caillois’ Patterns of Play 137
Game Interactions 141
Key Takeaways 142

Chapter 7  Applying Gamification to Problem Solving  143

Chapter Questions 143
Introduction 144
Differences Between Novices and Experts 145
Turning Novices into Experts 147
Preparing Firefighters 158
Gamification of Problem Solving 161
Key Takeaways 164

Chapter 8  Applying Gamification to Learning Domains 165
Chapter Questions 165
Introduction 166
Declarative Knowledge 167
Conceptual Knowledge 171
Rules-Based Knowledge 177
Procedural Knowledge 181
Soft Skills 185
Affective Domain 185
Psychomotor Domain 187
Key Takeaways 190

Chapter 9  Managing the Gamification Design Process 193
Chapter Questions 193
Introduction 194
Development Process: ADDIE vs. Scrum 195
Team 202
Design Document 205
Paper Prototyping 216
Key Takeaways 217

Chapter 10  Congratulations! Selecting the Right In-Game
Achievements, by Lucas Blair 219
Chapter Questions 219
Introduction 220
| Measurement vs. Completion Achievements | 220 |
| Boring vs. Interesting Tasks | 222 |
| Achievement Difficulty | 223 |
| Goal Orientation | 224 |
| Expected vs. Unexpected Achievements | 225 |
| When Achievement Notification Occurs | 227 |
| Achievement Permanence | 228 |
| Who Can See Earned Achievements? | 229 |
| Negative Achievements | 230 |
| Achievements as Currency | 231 |
| Incremental and Meta Achievements | 232 |
| Competitive Achievements | 233 |
| Non-Competitive Cooperative Achievements | 235 |
| Key Takeaways | 236 |

**Chapter 11**  
**Perspective of a Gamer, by Nathan Kapp**  
239

| Chapter Questions | 239 |
| Introduction | 240 |
| Gamer Generation | 240 |
| Mario Kart: Thinking Outside the Box | 240 |
| Madden Football: Analyzing Problems | 241 |
| RuneScape: The Art of the Deal | 243 |
| Civilization Revolution: Balancing Resources | 244 |
| Games vs. School | 245 |
| Key Takeaways | 246 |

**Chapter 12**  
**Casual Game Site: DAU Case Study, by Alicia Sanchez**  
247

<p>| Chapter Questions | 247 |</p>
<table>
<thead>
<tr>
<th>Chapter 13</th>
<th>Alternate Reality Games for Corporate Learning, by Koreen Olbrish</th>
<th>257</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Questions</td>
<td>257</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>258</td>
<td></td>
</tr>
<tr>
<td>Zombie Apocalypse</td>
<td>258</td>
<td></td>
</tr>
<tr>
<td>What Is an ARG?</td>
<td>259</td>
<td></td>
</tr>
<tr>
<td>ARG Terminology</td>
<td>260</td>
<td></td>
</tr>
<tr>
<td>Design Principles for ARGs</td>
<td>261</td>
<td></td>
</tr>
<tr>
<td>Potential of ARGs</td>
<td>263</td>
<td></td>
</tr>
<tr>
<td>Key Takeaways</td>
<td>264</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 14</th>
<th>If You Want to Learn More, Play Games</th>
<th>265</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Questions</td>
<td>265</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>266</td>
<td></td>
</tr>
<tr>
<td>Pick a Card, Any Card—A Game of Phones</td>
<td>266</td>
<td></td>
</tr>
<tr>
<td>Survival Master</td>
<td>271</td>
<td></td>
</tr>
<tr>
<td>The Virtue of Gamification</td>
<td>274</td>
<td></td>
</tr>
<tr>
<td>Next Steps</td>
<td>275</td>
<td></td>
</tr>
<tr>
<td>Key Takeaways</td>
<td>276</td>
<td></td>
</tr>
</tbody>
</table>

Glossary 277
Notes 285
Index 297
List of Figures and Tables

Figures

1.1 Taking the Stairs and Making Music! 3
2.1 The Goal? Be at the Top of the Leaderboard 34
2.2 The Hero’s Journey 44
3.1 Rat Pressing Bar to Receive Food Pellet 60
3.2 Flow, the State Between Boredom and Anxiety 72
4.1 Gamification Badges and Food: Both May Illicit the Same Chemical Reaction 89
5.1 Seeing the Battle Through the Eyes of the Enemy 115
6.1 Player Types and How TheyInteract 137
7.1 Riding a Fire Truck to Respond to a Call 159
7.2 Climbing the Ladder to Reach the Fire 160
7.3 Everyone Is Working on the Problem with a “Shared Purpose” 162
8.1 Learning Facts Through a Story-Based Interface 169
8.2 Drag and Drop of Road Safety Signs for Learning Facts 170
8.3 Trivia Game Interface 172
8.4 Teaching Facts with a Simple Matching Game 174
8.5 Helping United Healthcare Call Center Professionals Recognize,
    Differentiate, and Categorize Call Types 176
8.6 Ethics Instruction Using Game-Based Mechanics 179
8.7 Using a Board Game as a Familiar Convention 180
8.8 Teaching Call Center Representatives the
    Process of Entering Claims Data 182
9.1 Imagining an Actual Scrum 198
12.1 Building Missiles to Save the Earth from Aliens and to
    Learn Continuous Process Improvement 251
12.2 Gathering Requirements for the Right Cell Phone 252
12.3 Saving the World and Learning About Pricing 253
12.4 Learning About the Acquisition Lifecycle 254
12.5 Opening Screen of the DAU Games Portal 255
14.1 Sample Card from the Game of Phones Card Deck 267
14.2 Sample Challenge Card 268
14.3 Sample Technology Card 269
14.4 Sample Hardware Card 269
14.5 Sample Speaker Card 270
14.6 Player Waiting to Find Out Whether
    She Correctly Calculated Volume 272
14.7 Deciding Which Direction to Go to Complete the Mission 273
14.8 Creating a Group Shelter 274
List of Figures and Tables

Tables

Table 3.1 Operant Conditioning Reward Schedules 62
Table 3.2 Theories and Their Impact on Gamification 74
Table 4.1 Meta-Analysis Studies of Game-Based Learning 78
Table 6.1 Relationship Between Degrees of Freedom in Play and Different Game Activities 140
Table 8.1 Domains of Learning and Associated Instructional and Gamification Techniques 189
Table 9.1 Linking In-Game Activities to Assessment of Learning 201
Contents on the Web

The following materials are available to download from:
password: professional

Articles
Basic Games for Teaching Different Types of Content
Five Elements that Make Games Engaging
Obstacles to Adoption of Games in Corporate Environments

Worksheet
Simulation/Game Development Worksheet