

# Gamification-Based E-Learning Strategies for Computer Programming Education

Part of the Advances in Game-Based Learning Book Series

Ricardo Alexandre Peixoto de Queiros (Polytechnic Institute of Porto, Portugal) and Mário Teixeira Pinto (Polytechnic Institute of Porto, Portugal)

## Description:

Computer technologies are forever evolving and it is vital that computer science educators find new methods of teaching programming in order to maintain the rapid changes occurring in the field. One of the ways to increase student engagement and retention is by integrating games into the curriculum.

**Gamification-Based E-Learning Strategies for Computer Programming Education** evaluates the different approaches and issues faced in integrating games into computer education settings. Features emergent trends on the application of gaming to pedagogical strategies and technological tactics, as well as new methodologies and approaches being utilized in computer programming courses.

## Readers:

This book is an essential reference source for practitioners, researchers, computer science teachers, and students pursuing computer science.

ISBN: 9781522510345

Release Date: November, 2016

Copyright: 2017

Pages: 296

## Topics Covered:

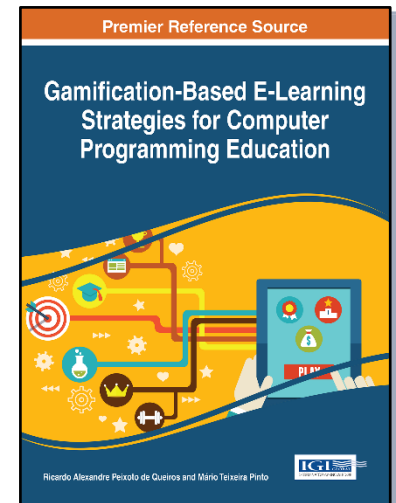
- 3D Virtual Worlds
- E-Learning
- Educational Computer Games
- Game Design Principles
- Mini-Games
- Programming Language Training
- Remote Experimentation

Hardcover +  
Free E-Access:

**\$200.00**

E-Access +  
Free Hardcover:

**\$200.00**



## Order Information

Phone: 717-533-8845 x100  
Toll Free: 1-866-342-6657  
Fax: 717-533-8661 or 717-533-7115  
Online Bookstore: [www.igi-global.com](http://www.igi-global.com)



## Table of Contents

### Section 1 Game Design Principles

#### Chapter 1

##### A survey on Game Backend Services

Ricardo Queirós  
Polytechnic Institute of Porto (IPP) & Center for Research in Advanced  
Computing Systems (CRACS/INESC-TEC);

#### Chapter 2

##### Learning Engineering Skills Through Creativity and Collaboration: a Game-Based Proposal

Marisa Gil  
Universitat Politècnica de Catalunya  
Beatriz Otero  
Universitat Politècnica de Catalunya

#### Chapter 3

##### Mastering Educational Computer Games, Educational Video Games, and Serious Games in the Digital Age

Kijpokin Kasemsap  
Suan Sunandha Rajabhat University

#### Chapter 4

##### Principles of a Casual Serious Game to Support Introductory Programming Learning in Higher Education

Adilson Vahldick  
Universidade do Estado de Santa Catarina (UDESC), Ibirama, SC, Brazil  
Maria J. Marcelino  
Universidade de Coimbra  
António J. Mendes  
Universidade de Coimbra

#### Chapter 5

##### The Introductory Programming Course: A Game Design Approach for the E-learning Environment

Nancy L. Martin  
Southern Illinois University  
Andrey Soares  
Southern Illinois University

### Section 2 Gamification Strategies in Computer Programming Learning

#### Chapter 6

##### Applying Gamification in a Parallel Programming Course

Javier Fresno  
Universidad de Valladolid  
Hector Ortega-Arranz  
Universidad de Valladolid  
Alejandro Ortega-Arranz  
Universidad de Valladolid  
Arturo Gonzalez-Escribano  
Universidad de Valladolid  
Diego R. Llanos  
Universidad de Valladolid

#### Chapter 7

##### Game-Based Approaches, Gamification and Programming Language Training

Serhat Bahadır Kert  
Yıldız Teknik Üniversitesi  
Mehmet Fatih ERKOÇ  
Yıldız Technical University

#### Chapter 8

##### Pedagogical Mini-Games Integrated into Hybrid Course to Improve Understanding of Computer Programming: Skill Building Without the Coding Constraints

Walter Nuninger  
University of Lille  
Jean-Marie CHATELET  
University of Lille

#### Chapter 9

##### Using 3D Virtual Worlds integrated to Remote Experimentation in Sciences Teaching

Caroline Porto Antonio  
Federal University of Santa Catarina  
José Pedro Scharadosim Simão  
Federal University of Santa Catarina  
João Bosco da Mota Alves  
Federal University of Santa Catarina  
Juarez Bento da Silva  
Federal University of Santa Catarina  
Aline Coelho dos Santos  
Federal University of Santa Catarina

#### Chapter 10

##### Using Game Frameworks to teach Computer Programming

Alberto Simões  
Instituto Politécnico do Cávado e do Ave

### Section 3 Frameworks and Tools

#### Chapter 11

##### Moodle Game-based Tool Trivoodle to Support the Learning of Programming Languages and Paradigms

Miriam Antón Rodríguez  
University of Valladolid  
María Angeles Pérez Juárez  
University of Valladolid  
Francisco Javier Díaz Pernas  
University of Valladolid

#### Chapter 12

##### Playing With Programming: A serious game to start programming

Anabela de Jesus Gomes  
Coimbra Institute of Engineering, Portugal  
Álvaro Nuno Ferreira Silva Santos  
Coimbra Institute of Engineering, Portugal  
César Paulo das Dores Páris  
Coimbra Institute of Engineering, Portugal  
Nuno Cid Martins  
Coimbra Institute of Engineering, Portugal

#### Chapter 13

##### Scripting Environments of Gamified Learning Management Systems for Programming Education

Jakub Swacha  
University of Szczecin

#### Chapter 14

##### Using a gamification service on a IDE for learning programming languages

José Paulo Leal  
Center for Research in Advanced Computing Systems (CRACS/INESC-TEC)  
José Paiva  
Center for Research in Advanced Computing Systems (CRACS/INESC-TEC)  
Ricardo Queirós  
Center for Research in Advanced Computing Systems (CRACS/INESC-TEC);

Ricardo Queirós holds a PhD on Computer Science and is an Assistant Professor of Computer Science at the Polytechnic Institute of Porto. He is also a researcher in the field of e-learning interoperability and programming languages learning at the Center for Research in Advanced Computing Systems (CRACS) research group of INESC TEC Porto. He is one of the development team members that created Enki, a gamified IDE for learning computer programming powered by Mooshak (a system for managing online programming contests often used in the IEEEExtreme competitions). He is also the author of 5 books regarding Android development and has almost 100 scientific publications focused on Computer Science education.

Mario Pinto, PhD in Computer Science at Portucalense University, Master of Electronics, and Computer Engineering at Faculty of Engineering - Porto University, and degree in Computer Science. Professor in Informatics Department, at the Polytechnic Institute of Porto. Coordinator of the Degree in Technology and Information Systems for the Web, Polytechnic Institute of Porto. President of the Scientific-Technical Council of ESEIG and member of the General Council of the Polytechnic Institute of Porto. Author of 11 books by the publisher Atlantic Center, in Informatics. Develops research activity in the areas of knowledge management systems; e-learning systems and mobile learning; e-assessment; several publications (over 30) in proceedings of international conferences, international journals and chapter books in Springer and IGI Global publishers. Member of the Scientific Committee of several international conferences, including: European Conference on Knowledge Management; European Conference on e-learning; Iberian Systems and Information Technologies Conference; World Conference on Information Systems and Technologies; Conferencia Iberica de Sistemas y Tecnologias de Information; Member of the International Society for Professional Innovation Management (ISPIM).

**Order Information**

Phone: 717-533-8845 x100

Toll Free: 1-866-342-6657

Fax: 717-533-8661 or 717-533-7115

Online Bookstore: [www.igi-global.com](http://www.igi-global.com)