

Premier Reference Source

# User-Centered Design Strategies for Massive Open Online Courses (MOOCs)



Ricardo Mendoza-Gonzalez



# User-Centered Design Strategies for Massive Open Online Courses (MOOCs)

Ricardo Mendoza-Gonzalez  
*Instituto Tecnológico de Aguascalientes, Mexico*

A volume in the Advances in Educational  
Technologies and Instructional Design (AETID)  
Book Series

**Information Science**  
**REFERENCE**

An Imprint of IGI Global

Published in the United States of America by  
Information Science Reference (an imprint of IGI Global)  
701 E. Chocolate Avenue  
Hershey PA, USA 17033  
Tel: 717-533-8845  
Fax: 717-533-8661  
E-mail: [cust@igi-global.com](mailto:cust@igi-global.com)  
Web site: <http://www.igi-global.com>

Copyright © 2016 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher. Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

CIP Data Pending

ISBN: 978-1-4666-9743-0

eISBN: 978-1-4666-9744-7

This book is published in the IGI Global book series Advances in Educational Technologies and Instructional Design (AE-TID) (ISSN: 2326-8905; eISSN: 2326-8913)

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: [eresources@igi-global.com](mailto:eresources@igi-global.com).



# Advances in Educational Technologies and Instructional Design (AETID) Book Series

Lawrence A. Tomei  
*Robert Morris University, USA*

ISSN: 2326-8905  
EISSN: 2326-8913

## MISSION

Education has undergone, and continues to undergo, immense changes in the way it is enacted and distributed to both child and adult learners. From distance education, Massive-Open-Online-Courses (MOOCs), and electronic tablets in the classroom, technology is now an integral part of the educational experience and is also affecting the way educators communicate information to students.

The **Advances in Educational Technologies & Instructional Design (AETID) Book Series** is a resource where researchers, students, administrators, and educators alike can find the most updated research and theories regarding technology's integration within education and its effect on teaching as a practice.

## COVERAGE

- Digital Divide in Education
- Social Media Effects on Education
- K-12 Educational Technologies
- Hybrid Learning
- Virtual School Environments
- Bring-Your-Own-Device
- Online Media in Classrooms
- E-Learning
- Educational Telecommunications
- Higher Education Technologies

IGI Global is currently accepting manuscripts for publication within this series. To submit a proposal for a volume in this series, please contact our Acquisition Editors at [Acquisitions@igi-global.com](mailto:Acquisitions@igi-global.com) or visit: <http://www.igi-global.com/publish/>.

The Advances in Educational Technologies and Instructional Design (AETID) Book Series (ISSN 2326-8905) is published by IGI Global, 701 E. Chocolate Avenue, Hershey, PA 17033-1240, USA, [www.igi-global.com](http://www.igi-global.com). This series is composed of titles available for purchase individually; each title is edited to be contextually exclusive from any other title within the series. For pricing and ordering information please visit <http://www.igi-global.com/book-series/advances-educational-technologies-instructional-design/73678>. Postmaster: Send all address changes to above address. Copyright © 2016 IGI Global. All rights, including translation in other languages reserved by the publisher. No part of this series may be reproduced or used in any form or by any means – graphics, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems – without written permission from the publisher, except for non commercial, educational use, including classroom teaching purposes. The views expressed in this series are those of the authors, but not necessarily of IGI Global.

## Titles in this Series

For a list of additional titles in this series, please visit: [www.igi-global.com](http://www.igi-global.com)

### *Handbook of Research on Estimation and Control Techniques in E-Learning Systems*

Vardan Mkrttchian (HHH University, Australia) Alexander Bershady (Penza State University, Russia) Alexander Bozhday (Penza State University, Russia) Mikhail Kataev (Tomsk State University of Control System and Radio Electronics, Russia) and Sergey Kataev (Tomsk State Pedagogical University, Russia)  
Information Science Reference • copyright 2016 • 554pp • H/C (ISBN: 9781466694897) • US \$235.00 (our price)

### *Handbook of Research on Active Learning and the Flipped Classroom Model in the Digital Age*

Jared Keengwe (University of North Dakota, USA) and Grace Onchwari (University of North Dakota, USA)  
Information Science Reference • copyright 2016 • 450pp • H/C (ISBN: 9781466696808) • US \$300.00 (our price)

### *Handbook of Research on Applied Learning Theory and Design in Modern Education*

Elena Railean (European University of Moldova, Moldova) Gabriela Walker (University of South Dakota, USA) Atilla Elçi (Aksaray University, Turkey) and Liz Jackson (University of Hong Kong, Hong Kong)  
Information Science Reference • copyright 2016 • 866pp • H/C (ISBN: 9781466696341) • US \$400.00 (our price)

### *Handbook of Research on Strategic Management of Interaction, Presence, and Participation in Online Courses*

Lydia Kyei-Blankson (Illinois State University, USA) Joseph Blankson (Ohio Northern University, USA) Esther Ntuli (Idaho State University, USA) and Cynthia Agyeman (Ohio University, USA)  
Information Science Reference • copyright 2016 • 611pp • H/C (ISBN: 9781466695825) • US \$235.00 (our price)

### *Intelligent Design of Interactive Multimedia Listening Software*

Vehbi Turel (Bingol University, Turkey)  
Information Science Reference • copyright 2015 • 448pp • H/C (ISBN: 9781466684997) • US \$215.00 (our price)

### *Utilizing Virtual and Personal Learning Environments for Optimal Learning*

Krista Terry (Appalachian State University, USA) and Amy Cheney (Appalachian State University, USA)  
Information Science Reference • copyright 2016 • 375pp • H/C (ISBN: 9781466688476) • US \$185.00 (our price)

### *Handbook of Research on Individual Differences in Computer-Assisted Language Learning*

Mehrak Rahimi (Shahid Rajaei Teacher Training University, Iran)  
Information Science Reference • copyright 2015 • 571pp • H/C (ISBN: 9781466685192) • US \$325.00 (our price)

### *Fuzzy Logic-Based Modeling in Collaborative and Blended Learning*

Sofia J. Hadjileontiadou (Hellenic Open University, Greece) Sofia B. Dias (Universidade de Lisboa, Portugal) José A. Diniz (Universidade de Lisboa, Portugal) and Leontios J. Hadjileontiadis (Aristotle University of Thessaloniki, Greece)



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

701 E. Chocolate Ave., Hershey, PA 17033

Order online at [www.igi-global.com](http://www.igi-global.com) or call 717-533-8845 x100

To place a standing order for titles released in this series, contact: [cust@igi-global.com](mailto:cust@igi-global.com)

Mon-Fri 8:00 am - 5:00 pm (est) or fax 24 hours a day 717-533-8661

## Editorial Advisory Board Members

Antonio Silva Sprock, *Universidad Central de Venezuela, Venezuela*

Miguel A. García-Ruiz, *Algoma University, Canada*

Miguel Vargas Martin, *University of Ontario Institute of Technology, Canada*

César Alberto Collazos Ordoñez, *Universidad del Cauca, Colombia*

María de Lourdes Yolanda Margain Fuentes, *Universidad Politécnica de Aguascalientes, Mexico*

Josefina Guerrero García, *Benemérita Universidad Autónoma de Puebla, Mexico*

Jaime Muñoz Arteaga, *Universidad Autónoma de Aguascalientes, Mexico*

## List of Reviewers

Huizilopoztli Luna-García, *Universidad Autónoma de Zacatecas, Mexico*

Alfredo Mendoza-González, *Universidad Autónoma de Aguascalientes, Mexico*

Marina Muñoz Serna, *Universidad Autónoma de Zacatecas, Mexico*

Mario A. Rodríguez Díaz, *Instituto Tecnológico de Aguascalientes, Mexico*

# Table of Contents

Preface..... xvi

Acknowledgment ..... xxiii

## Section 1

### Fostering Social Learning with MOOCs: Perspectives and MOOCs Applications Oriented to Promote Social Learning Among People

#### Chapter 1

Facilitating Student Interaction and Collaboration in a MOOC Environment ..... 1  
*Stein Brunvand, University of Michigan-Dearborn, USA*

#### Chapter 2

Users' Digital Competences Study to Design MOOCs for Digital Literacy in Mexico ..... 15  
*Ricardo Mendoza-Gonzalez, Instituto Tecnológico de Aguascalientes, Mexico*  
*Laura C. Rodríguez-Marínez, Instituto Tecnológico de Aguascalientes, Mexico*  
*Mario A. Rodríguez-Díaz, Instituto Tecnológico de Aguascalientes, Mexico*

#### Chapter 3

MOOCs and Multiple Learning Styles ..... 30  
*Sandra Jiménez González, Universidad Politécnica de Aguascalientes, Mexico*  
*Ricardo Mendoza-González, Instituto Tecnológico de Aguascalientes, Mexico*  
*Laura C. Rodríguez-Martínez, Instituto Tecnológico de Aguascalientes, Mexico*  
*Mario Rodríguez-Díaz, Instituto Tecnológico de Aguascalientes, Mexico*

## Section 2

### Designing Interactions for MOOCs: Strategies, Studies and Methods to Define Starting Points for Well Designed MOOCs' Interactions

#### Chapter 4

Identifying Parent's Security Requirements for Web Filtering in MOOCs for Kids ..... 48  
*Juanita Avila Sánchez, Procuraduría General de Justicia de Aguascalientes, Mexico*  
*Ricardo Mendoza González, Instituto Tecnológico de Aguascalientes, Mexico*

## **Chapter 5**

- Finding the Design Basic for MOOCs: Analyzing the UIs of edX, Coursera, and Udacity..... 67  
*Sandra G. Jiménez-González, Universidad Politécnica de Aguascalientes, Mexico*  
*Huizilopoztli Luna-García, Universidad Autónoma de Zacatecas, Mexico*  
*Ricardo Mendoza-González, Instituto Tecnológico de Aguascalientes, Mexico*

## **Chapter 6**

- Online Community-Based Practices for Massive Open Online Courses (MOOCs) at Open Universities Australia: A Case Study..... 83  
*Mandi Axmann, Open Universities, Australia*  
*Ren Atkins, Open Universities, Australia*

## **Chapter 7**

- Using Design Patterns to Incorporate Usability in Notifications from MOOCs ..... 99  
*Ricardo Mendoza-González, Instituto Tecnológico de Aguascalientes, Mexico*

### **Section 3**

#### **Inclusive MOOCs: Exploring Some Alternatives to Design Inclusive MOOCs for Diverse Users**

## **Chapter 8**

- Design, Implementation and Evaluation of MOOCs to Improve Inclusion of Diverse Learners..... 115  
*Sandra Sanchez-Gordon, National Polytechnic School of Ecuador, Ecuador*  
*Sergio Luján-Mora, University of Alicante, Spain*

## **Chapter 9**

- Addressing Accessibility of MOOCs for Blind Users Hearing Aid for Screen Orientation ..... 142  
*Teresita de Jesús Álvarez Robles, Universidad Veracruzana, México*  
*Alfredo Mendoza González, Universidad Juárez Autónoma de Tabasco, México*  
*Alma Rosa García Gaona, Universidad Veracruzana, México*  
*Francisco Alvarez Rodríguez, Universidad Autónoma de Aguascalientes, México*

## **Chapter 10**

- Enabling MOOCs' Usage to Mild and Moderate Intellectual Disabled Users: An Approach to Enhance Mobile Interfaces ..... 157  
*Alfredo Mendoza González, Universidad Juárez Autónoma de Tabasco, México*  
*Francisco Alvarez Rodríguez, Universidad Autónoma de Aguascalientes, México*

### **Section 4**

#### **Evaluation Strategies for MOOCs: Describing Some Proposals for Students Evaluation in MOOCs**

## **Chapter 11**

- Automatic Item Generation for Elementary Logic Quizzes via Markov Logic Networks ..... 177  
*Davor Lauc, University of Zagreb, Croatia*  
*Nina Grgić Hlača, University of Zagreb, Croatia*  
*Sandro Skansi, Infigo IS, Croatia*



<b>Chapter 12</b>	
An Elastic Platform for Large-scale Assessment of Software Assignments for MOOCs (EPLASAM) .....	187
<i>Michael Walker, Vanderbilt University, USA</i>	
<i>Douglas C. Schmidt, Vanderbilt University, USA</i>	
<i>Jules White, Vanderbilt University, USA</i>	

### Section 5

### Future Trends and Applications: Analyzing Some Future Venues to Enhance Interaction and Applications of MOOCs

<b>Chapter 13</b>	
The Role of Virtual Worlds for Enhancing Student-Student Interaction in MOOCs .....	208
<i>Rosa Reis, Instituto Superior de Engenharia do Porto, Portugal</i>	
<i>Paula Escudeiro, Instituto Superior de Engenharia do Porto, Portugal</i>	

<b>Chapter 14</b>	
Towards a Gamification Design Process for Building Engaging MOOCs .....	222
<i>Aikaterini Kalogeraki, Open University of Cyprus, Cyprus</i>	

<b>Chapter 15</b>	
Use of Augmented Reality a New Vision on the Massive Open Online Courses .....	254
<i>Julio Ponce, Universidad Autonoma de Aguascalientes, México</i>	
<i>Francisco Ornelas, Universidad Politecnica de Aguascalientes, México</i>	
<i>Francisco Álvarez, Universidad Autonoma de Aguascalientes, México</i>	
<i>Beatriz Toscano, Universidad Autonoma de Nayarit, México</i>	

<b>Chapter 16</b>	
Therapy Reports through a Supervision Model using MOOCs.....	272
<i>Raúl Alejandro Gutiérrez García, Universidad Politecnica de Aguascalientes, Mexico</i>	
<i>Kalina Isela Martínez Martínez, Universidad Autonoma de Aguascalientes, Mexico</i>	
<i>Karina Elizeth Armas de Santos, Universidad Politecnica de Aguascalientes, Mexico</i>	
<i>José Antonio Saldivar Cervantes, Universidad Politecnica de Aguascalientes, Mexico</i>	
<i>María Abigail Paz Pérez, Universidad Politecnica de Aguascalientes, Mexico</i>	

<b>Compilation of References</b> .....	287
--	-----

<b>About the Contributors</b> .....	315
-------------------------------------	-----

<b>Index</b> .....	321
--------------------	-----

# Detailed Table of Contents

<b>Preface</b> .....	xvi
<b>Acknowledgment</b> .....	xxiii

## Section 1

### **Fostering Social Learning with MOOCs: Perspectives and MOOCs Applications Oriented to Promote Social Learning Among People**

#### **Chapter 1**

Facilitating Student Interaction and Collaboration in a MOOC Environment .....	1
<i>Stein Brunvand, University of Michigan-Dearborn, USA</i>	

Collaborative learning facilitates the clarification of ideas, provides access to peer-feedback and promotes the sharing of diverse and alternate perspectives (Stacey, 2007). Guardia, Maina and Sangra (2013) identified collaborative learning as a key design principle for MOOCs and the interactions facilitated through this kind of learning are often considered to be as valuable as the direct instruction provided by the teacher (Stewart, 2013). This chapter explores a variety of technologies and pedagogical approaches that can be employed in a MOOC environment to promote collaboration and student interaction. Benefits and drawbacks of these strategies are considered in order to help guide decisions about the instructional design of MOOCs.

#### **Chapter 2**

Users' Digital Competences Study to Design MOOCs for Digital Literacy in Mexico .....	15
<i>Ricardo Mendoza-Gonzalez, Instituto Tecnológico de Aguascalientes, Mexico</i>	
<i>Laura C. Rodríguez-Martínez, Instituto Tecnológico de Aguascalientes, Mexico</i>	
<i>Mario A. Rodríguez-Díaz, Instituto Tecnológico de Aguascalientes, Mexico</i>	

Several government programs oriented to contribute in reducing digital divide gaps have emerge in Mexico, particularly in States like Jalisco, Nayarit, Nuevo Leon, Veracruz, and Aguascalientes. However, current alternatives have certain weaknesses and issues that should be solved in order to provide appropriate literacy. To contribute in achievement of this goal, here is proposed an alternative to conform a strategy based on Massive Open Online Courses (MOOCs). First, a study was performed to establish the actual level of digital competences of current program users, and then obtained feedback was considered to structure the contents to offer through the MOOCs. This study was performed in the Aguascalientes state government program Vagones de Ciencia.