



© RITHA PUBLISHING

# Digital Future in Education. Paradoxes, Hopes and Realities

## Table of Contents

### From the Editor

#### Editorial Board

PhD [Laura Nicola-Gavrilă](#)  
Publisher Manager

PhD [Daniela Dănculescu](#)  
Book Series Coordinator

#### SERITHA BOOK SERIES

Socio-Economics Research,  
Innovation and Technologies

Online ISSN 3008 – 4229

ISSN-L 3008-4229

Print ISSN 3008-4237

<https://doi.org/10.57017/SERITHA>

#### Digital Future in Education. Paradoxes, Hopes and Realities

Online ISBN 978-606-95516-1-5  
<https://doi.org/10.57017/SERITHA.2023.DFE>

Copyright © 2023

RITHA PUBLISHING, business  
unit of SCIRES WEB Ltd



Address: No.6, V.G. Paleolog  
Street, 200231, Craiova, Romania

<b>Chapter 1.</b> Education and Technology in a Data Driven Society. Turning Data into Education Intelligence <i>by Laura Nicola-Gavrilă</i>	...12
1.1. Impact of Data-driven Approaches in Education	...13
1.2. Harnessing the Power of Education Data. Data Ingestion versus Data Integration?	... 15
1.3. Data Driven Approach. A Major Challenge for Education	... 19
1.4. Data-Driven Technologies to Improve Education. Outstanding Solutions and Experiences	... 21
1.4.1. Non-Presential Supervision of Assessment Tests	... 22
1.4.2. Identification of Behavioral or Attention Problems	... 24
1.4.3. Personalized and More Engaging Training Programs	... 28
1.5. Education and Technologies: Conclusions and Further Research	... 30
<b>Chapter 2.</b> Information Epistemology in Digital Learning <i>by Yang I. Pachankis</i>	...34
2.1. Digital Artefacts in Education	... 35
2.2. Research Framework of Learning Processes	... 36
2.3. Education Digitization with Information Infrastructure	... 38
2.4. Digital Education Perspectives	... 39
<b>Chapter 3.</b> Online Learning and Digital Education of the Future. The Role of Digital Learning in Education <i>by Sidharta Chatterjee and Samanta Mousumi</i>	...44
3.1. Educational Systems Literature Review	... 46
3.2. The Focus on Digitalization of Education	... 47
3.3. The Digital Driver of Economic Growth and Social Development	... 49
3.4. The Future of Education Digitalized	... 49
3.4.1. Tomorrow Belongs to Those Who Prepare for it Today	...50
3.4.2. Digitalization of the Education System in the Context of India	...52
3.5. Benefits of Digital Education and Digitalization of Education	... 53



© RITHA PUBLISHING

# *Digital Future in Education. Paradoxes, Hopes and Realities*

## *Table of Contents*

### **Scientific Board of RITHA Publishing**

PhD [John K. CHRISTIANSEN](#)  
Copenhagen Business School,  
DK  
PhD [Giacommo DI FOGGIA](#)  
University of Milano-Bicocca, IT  
PhD [Luca GRILLI](#)  
University of Foggia, IT  
PhD [Sebastian KOT](#)  
Czestochowa University of  
Technology, PL  
PhD [Piotr MISZTAL](#)  
Jan Kochanowski University, PL  
PhD [Michal MROZEK](#)  
University of Szczecin, PL  
PhD [Marco NOVARESE](#)  
University Piemonte Orientale, IT  
PhD [Ainura OMAROVA](#)  
Karaganda Economic University,  
Faculty of Economics, KZ  
[Antonio PACIFICO](#)  
University of Macerata, IT  
PhD [Ramona PÎRVU](#)  
University of Craiova, RO  
PhD [Claudiu Ionut POPÎRLAN](#)  
University of Craiova, RO  
PhD [Emanuela  
TVARONAVIČIENĖ](#)  
Vilnius Gediminas Technical  
University, LT  
PhD [Jolita VVEINHARDT](#)  
Vytautas Magnus University, LT

<b>Chapter 4.</b> Connectedness, Collaboration, and Co-creation <i>by Ayine Nigo and Vincent Gibogwe</i>	...58
4.1. Today's Learning and Education	...59
4.2. Education and Innovation	...60
4.2.1. Networking and Teamwork	...62
4.2.2. Anywhere, Anytime, Learning	...64
4.3. Customization for a Learner-First Approach	...66
4.3.1. Research Methodology	...69
4.3.2. Study Design	...71
4.4. Digital Future of Education. Some Discussions and Conclusions	...73
<b>Chapter 5.</b> Using Game-Based Learning to Improve Learning Outcomes in K-12 Mathematics Education <i>by John Knight</i>	...79
5.1. Advantages and Disadvantages of Games based Learning	... 81
5.1.1. Alternatives to Games based Learning	... 81
5.1.2. Principles, Characteristics and Mechanisms of Games based Learning	... 82
5.1.3. Successful Strategies in Games based Learning	... 83
5.2. Creating a Digital Game-Based Learning Game focused on Arithmetic Training	... 85
5.3. Research Framework and Experiments for Testing Game-based Learning	... 88
5.3.1. Experiments. Playtest Script	... 89
5.3.2. Playtest Results	... 90
5.3.3. Approach to Testing Design Questions and Playtest Methods	... 92
5.4. Action Items and Future Work	... 94











© RITHA PUBLISHING

# Digital Future in Education. Paradoxes, Hopes and Realities

## Table of Contents

### Chapters Contributors

-  Elena CEDROLA 
-  Sidharta CHATTERJEE 
-  Alberto COSTANTIELLO 
-  Edgar R. ESLIT 
-  Vincent GIBOGWE 
-  Luca GIRALDI 
-  John KNIGHT  
-  Angelo LEOGRANDE 
-  Laura NICOLA-GAVRILĂ 
-  Samanta MOUSUMI 
-  Ayine NIGO 
-  Antonio PACIFICO 
-  Yang I. PACHANKIS 
-  Aderajew M. TESSEMA 

<b>Chapter 6.</b> Exploring the Implementation of Online Learning at the Higher Institutions of Ethiopia: The Case of American College of Technology & Harambee University <i>by Tessema, Aderajew Mihret</i>	...102
6.1. Background Research of Online Education	...104
6.2. Statement of the Problem. Research Questions and Ethical Issues. Methodology Employed for the Study	...108
6.3. Analysis and Interpretation of Quantitative and Qualitative Data	...111
6.4. Discussions and Research Findings of Quantitative and Qualitative Analysis	...127
<b>Chapter 7</b> Language and Literature Education in the Era of Global Connectivity: Navigating Multilingualism, Cultural Diversity, and Technological Advancements <i>by Edgar R. Eslit</i>	...140
7.1. State-of-the-Art Language and Literature Education in the Digital Age	...143
7.2. Comprehensive and In-Depth Exploration of Language and Literature Education	...150
7.3. Key Findings and Some Discussions Derived from the Interpretation and Analysis of the Data	...152
7.4. Contributions and Future Directions for Language and Literature Education	...157



© RITHA PUBLISHING

# *Digital Future in Education. Paradoxes, Hopes and Realities*

## *Table of Contents*

<b>Chapter 8. Student Performance in E-learning Systems. An Empirical Study</b> <i>by Antonio Pacifico, Luca Giraldi and Elena Cedrola</i>	...164
8.1. Discussion Within Related Studies	...167
8.2. E-learning Systems and Educational Platforms: An Overview	...168
8.3. Research Methodology for Two-Step Robust Bayesian Multiclass Procedure	...170
8.3.1. Bayesian Methods and MCMC Algorithms: First Step	...172
8.3.2. Multinomial Logistic Function: Second Step	...174
8.3.3. Prior Assumptions and MCMC Algorithms	...175
8.4. Real-Case Study	...179
8.4.1. MOOC-Based E-learning Platform	...179
8.4.2. Data Description and Results	...180
<b>Chapter 9. The Impact of Government Expenditure on Education in the Environmental, Social and Governance Models at World Level</b> <i>by Angelo Leogrande and Alberto Constantiello</i>	...190
9.1. Literature Review on Education in the Environmental, Social and Governance	...191
9.2. Econometric Model to Estimate the Determinants of Government Expenditure on Education (GEE)	... 193
9.3. Clustering with k-Means Algorithm Optimized with the Elbow Method	... 196
9.4. Predictions and Machine Learning for the Future Value of Government Expenditure on Education	... 199
List of Tables	... 210
List of Figures	... 211
List of Abbreviations	... 212
List of Key Concepts	... 215

Copyright © 2023

**RITHA PUBLISHING**, business  
unit of SCIRES WEB Ltd



Address: No.6, V.G. Paleolog  
Street, 200231, Craiova,  
Romania