BOOK REVIEW

CARMEN BUENO MUÑOZ / LUIS R. MURILLO ZAMORANO / JOSÉ ÁNGEL LÓPEZ SÁNCHEZ: GAMIFICATION AND ARTIFICIAL INTELLIGENCE DURING COVID-19: CASE STUDIES IN HEALTH AND EDUCATION

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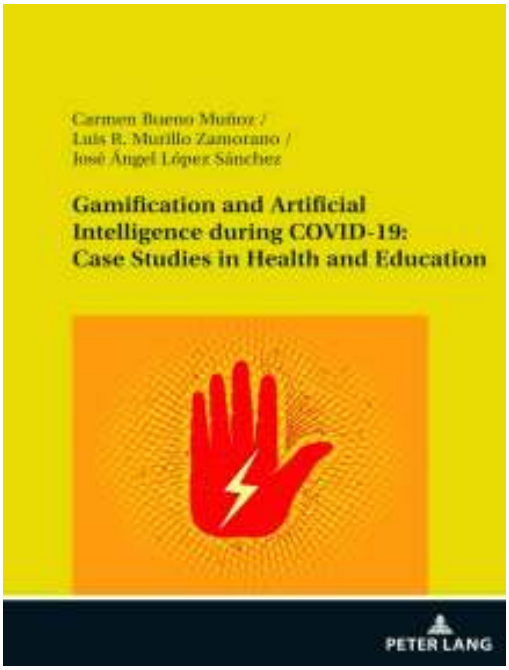

Reviewed work:

Gamification and Artificial Intelligence during Covid-19: Case Studies in Health and Education

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The 2022 publication of Carmen Bueno Muñoz, Luis R. Murillo Zamorano and José Ángel López Sánchez, *Gamification and Artificial Intelligence during Covid-19: Case Studies in Health and Education*, – Peter Lang, Berlin, 130 pages – comes as a timely answer to the EU's digitalisation strategies and the worldwide experiences of the past two years by analysing the areas digital tools were massively applied in during the pandemic, sheding light upon its ethical background, too. Two of the main domains digitalisation played a crucial role in were/are health care and education, the authors presenting the two key components of this enhanced process, gamification understood as techniques engaging with the use of digital devices, platforms and artificial intelligence machines use in their analysis, decision making and acting process.

After an introductory part (chapter 1), the book is structured into five more chapters dealing with gamification during the pandemic in health care and education system (chapter 2), artificial intelligence (AI) in both segments (chapter 3), the applications used in the analysed domains (chapter 4), the ethical issues they might raise (chapter 5), all this summarised in the concluding chapter 6.

If the importance of gamification, through its engaging character, is quite obvious in the domain of education, it might present a novelty for health care, where it "is used to promote healthy habits and behaviors such as physical exercise and to encourage self-management of different aspects related to health status." (Trinidad et al., 2021, in Muñoz et al., 2022, p. 15) and to help to stop the spread of the virus through a responsible attitude. Figures similar to points in games, leader boards showing the lowest level of infection rate in certain regions simulating a competition, the archetypes borrowed from games – heroes (fighting the pandemic) and villains (deniers of the existence of the virus) – location-based applications for warning were all, in this attempt, digital allies of the authorities responsible for the development of almost 67% of all applications. Patient management applications played an important role not only in maintaining physical but also mental health reducing the sense of isolation and cognitive decline with elder people. Other health-related tools were contact tracing apps like: Immuni in Italy, STAYAWAY COVID in Portugal, Corona-Warn-App in Germany, NZ Covid Tracer in New Zealand – controversial to a certain extent as raising ethical issues, such as privacy and personal rights concerns –, as well as sports apps encouraging physical activity and fitness.

In education, besides digital tools facilitating lecture holding and information transfer, gamification helped all participants to cope with stress caused by isolation and students to keep up motivation for academic performance. Some educational platforms to be mentioned are: Solve Education!, Kahoot, Science Level Up, Gamified Educational Network (GEN).

In recent times, artificial intelligence is applied in almost all domains of everyday life, thus, due to data collection, it has played a crucial role in the prediction and monitoring of different diseases, virus spreads, contact-tracking and movement of infected persons. Voice assistants, like Alexa or chatbots, could be used not only in everyday life management, but also in telemedicine, through analysing the patient's symptoms, disease evolution, putting up a diagnosis and offering community support and mental help.

In the context of COVID-19 pandemic AI has also found application in the development of vaccines and drugs and in the repurposing of the latter ones, respectively. It is interesting to see, to what extent AI could back-up educational process. The four areas of its applicability identified by Zawacki-Richter et al. (2020) would be: profiling and prediction for outlining students' performance and dropping out rate, intelligent tutoring system for stating individual learning paths for students, assessment and evaluation supported by proctor programmes and adaptive systems and personalisation for course development and tailoring to learners needs and level of performance. According to Krishnamurthy (2020) the new normality after the pandemic should include AI-based services in education. Besides education and health care, the authors determined both for gamification and AI other application segments, as well, ranging from business to social media and fight against misinformation.

In chapter four the authors try to realise a convergence of the two key components

of digitalisation, thus the readers make acquaintance with two applications used in each of the previously analysed domains, namely Dreamlab: Corona-AI and uMore, applied in health care, and, respectively, Century and ELSA Speak, educators could resort to.

Dreamlab: Corona-AI had a twofold effect: on one hand, it provided its users with informational support related to the virus and, on the other hand, by using this app, participants contributed to the research run by the Imperial College London upon the impact molecules of food and drugs could have upon the COVID-19 disease.

uMore is a free application, created from scratch, targeting mental wellbeing by using "cognitive behavioral therapy, acceptance and commitment therapy, mindfulness and behavioral science techniques" (p. 60). Due to its gamified design, its users' engagement in adopting healthy habits is guaranteed.

Initially a payment-based educational platform, Century started to offer its services for free during the pandemic, to help both teachers and students to achieve learning performance and to fill in learning gaps. Thanks to AI, boredom and consequently motivational loss on students' side and excessive workload caused by the personalised teaching/learning process on teachers' side could be avoided. The platform used to assist students individually in their learning progress and to inform teachers about it, so that they could help students in a targeted way.

Based on AI, ELSA Speak (English Learning Speech Assistant) helps, due to the speech recognition function, to identify mistakes and improve pronunciation of non-native speakers of English.

The great merit of the book is to present in an objective, unbiased way, not only the advantages but also the drawbacks of the listed digital resources, should the latter be the lack of availability in all regions/languages, the costs they might imply, the reluctance implementing them because of lack of expertise and too high complexity, the dependence on a big set of data, or ethical issues like social injustice, uneven access to digital tools, known as digital divide, distrust of AI, dilemmas concerning individual privacy as AI needs a considerable set of data to function well, issues of transparency, of legal background related to its operation and responsibility in impacting human behaviour.

This is a quality the inconsistency in gendering – referring to the CEO of Century both by she/her and his – and in the use of acronyms – both FL/LF for federated learning, AI/IA for artificial intelligence –, or stylistic and grammar issues like "Some examples of entities whose websites on which this chatbot has been inserted are national, regional and local government bodies (…)" (p. 39), "In the *habit loop* on which the app is based, (…)" (p. 62) etc., continuously present throughout the work, could not affect.