EDUCATIONAL TECHNOLOGIES TO EMPOWER HIGHER EDUCATION

Vega Garzón, J.C; Magrini, M.L; Galembeck, E.

Department of Biochemistry, Institute of Biology, State University of Campinas
(UNICAMP), Campinas, Brazil. Phone: 55 (19) 3521-6653, e-mail:
j151757@dac.unicamp.br

Introduction and objectives: The New Media Consortium (NMC) Horizon Project defines educational technology in a broad sense as tools and resources that are used to improve teaching, learning, and creative inquiry. Each technology has been carefully researched and framed in the context of its potential impact on higher education. Within the Horizon Project there are currently seven categories of technologies, tools, and strategies for their use that the NMC monitors continuously. All they have the potential to foster real changes in education, particularly in the development of progressive pedagogies and learning strategies; the organization of teachers' work; and the arrangement and delivery of content. Following the recommendations of NMC experts panel, we design an application named Augmented Reality Metabolic Pathways (ARMET) in order to improve motivation and to promote student interactivity to the development of skills needed to learn the metabolic pathways. Materials and methods: The ARMET app was developed using Unity, 3D molecules obtained from Protein Data Bank and ChemSpider-chemical structure database, the usage data are stored into a database (MySQL) and are analyzed using the statistical software R. Results and conclusions: ARMET mixes several technologies out of seven categories recommend in the NMC Horizon Report: Mobile app, Bring Your Own Device, Flipped Classroom, Learning Analytics and Augmented Reality. The principal criterion for the inclusion of those technologies into the app was its potential relevance to teaching and learning biochemistry. ARMET is available for iOS and Android platforms, and includes PDF files with a set of cards, the game board and classroom worksheet's. The students and teachers can register for free. Teachers can create classes and track student performance. ARMET collects data for personalizing learning experiences addressing the challenge to build better pedagogical tools to establish effective formative assessment for metabolism teaching.

Key Words: Augmented Reality, Flipped Classroom, Learning Analytics.

Supported by: Administrative Department of Science, Technology and Innovation - COLCIENCIAS (Colombia).