EU HORIZON 2020 Project

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Networked labs for training in sciences and technologies

Deliverable D4.1 Summary

The NEWTON project aims to support and enhance the delivery of online STEM subjects through a variety of technologies and pedagogical approaches. This deliverable presents a detailed literature review of self-directed pedagogical approaches considered by the NEWTON project, such as flipped classroom, online problem-based learning and computer supported collaborative learning. Self-directed learning is especially important in online environments and presents many benefits including preparing students for life-long learning and helping them develop 21st century skills. This deliverable also reviews previous applications of Augmented Reality (AR) and gamification in educational contexts. Recommendations regarding the applicability of the investigated technologies and pedagogical approaches for STEM modules are also proposed. Moreover, the deliverable presents the proposed NEWTON AR technical specification, as well as the novel NEWTON-Enhanced Gamification Model (N-EGM).

The objective of this deliverable is to provide the literature review on self-directed pedagogical methods, augmented reality and gamification. The deliverable includes:

- Output from activities A4.1.1, A4.2.1 and A4.3.1, that consists of literature review of the three pedagogical approaches (i.e., self-directed learning, augmented reality and gamification).
- Output from activities A4.1.2, A4.2.2 and A4.3.2, that consists of investigation and recommendations regarding the applicability of the three-investigated pedagogical approaches for different STEM modules.