Smart-Education in the context of Industry 4.0

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Abstract

During the last years of the pandemic of COVID, many institutions of education have adopted online LMS to pursuit their teaching activities, when others have maintained limited face-to-face activities, merged with online learning. On the other hand, some colleges have been closed without any online learning or with off-line asynchronous less organized learning activities. The lessons learned from this practical experience have revealed many limitations and vulnerabilities, especially those related to the experimentation activities, the authentication and assessment of learners, the automatic customization of learning pathways. In addition, with the arrival of Industry 4.0 (I4.0), our education system will face yet other challenges, not only in relation with the technological way of knowledge delivery, but also it calls to review and innovate the knowledge contents of the training and teaching programs. Some potential disciplines of I4.0 should be exploited to evolve our existing education systems.

Distance learning platforms (MOOCs …) have made a significant contribution to providing learners with diversified contents to fill the gaps and deal with certain face-to-face difficulties. This worked well for less practical disciplines. Unfortunately, for the disciplines requiring more face-to-face practice, software simulation cannot replace real experimentation. Meanwhile, we can improve these tools to make the whole activity more efficient and able to reach with success the expected learning objectives. This will end up to what we call smart-education, when others use the term of Education 4.0 and even University 4.0.

Our perception of smart-education in this context is much more like an open learning system with concerns of acquiring knowledge and 'know-how' for different disciplines. It is about learning from organized activities in classrooms or via online LMS, and through free and spontaneous situations in spaces that are not necessarily institutional. We propose to exploit the capabilities of learners' smartphones (or equivalent devices) with their integrated sensors, including cameras, through the world of I4.0. We expect to take learning benefits with its new technological trends in artificial intelligence, IIoT, smarthomes, smartcities, Edge/Fog/Cloud Computing, XR … Under this vision, the teaching process will not be only ensured by human actors, but machines and programs will also assist and enrich this activity. Already some similar applications emerged like chatbots on Websites and smart assistants at homes, but we expect to see more applications and services much more focused on learning and learners, involving low-cost virtual (VR) and augmented (AR) realities.

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