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DIGITALIZING WORLD EDUCATION AND INDUSTRY

Governments and businesses have always recognized that Higher Education has a major contribution to make to the economy and sustainability. Digital transformations from 1.0 to 4.0 can reinforce the important link from Higher Education to industry and employability. The article gives a short review of the last 1000 years, deconstructed into three stages. World education has been influenced by the development of the Internet as well as the Industrial revolutions over the last 250 years. Economies, industries and jobs around the world are reformed by new knowledge and technologies. The development of Higher Education is to be considered alongside with the development of the World Wide Web that started off as transmissive (1.0), social (2.0), and semantic (3.0) [1].

Education 1.0. Transmissive. The first modern university in Europe was founded in Bologna in 1088, then in Paris, Oxford and Cambridge. From the beginning of modern universities, students received knowledge from lecturers or academics. They provided students with information in the form of reading lectures or discourse. It should be mentioned that the sense of the word "lecture" means "written works, literature," "learning from books" (from late 14 c.), "a reading aloud, action of reading aloud" (from early 15 c.). The sense of "a discourse on a given subject before an audience" emerged in 1530s. The visual aids, books, notes and handouts, authentic resources and experiences played a key role in transmitting ideas, promoting creativity and prevailing cultures. In Higher Education 1.0 students were mostly users of information resources that were supplied to them for learning. Thus, the stage of Education 1.0 was the transmissive way of learning suited well for centuries.

Around 60 years ago, there was a considerable growth of the numbers of students entering universities. More and more young people became eligible for Higher Education. Universities attracted scholars from around the world to their campuses and international students mobility across countries increased. The so-called Education 1.25 had arrived. Due to the huge reach of TV broadcasting, mass technology and education innovations of the 20th century, the Open University was established in 1969, giving anyone, anywhere the power to learn. The Open University has pioneered distance learning for over 50 years, delivering exceptional teaching and outstanding support to students across the UK and the world. Other countries reproduced the Open University model for distance learning. Mobility and flexibility started to be valued, and distance learning or online learning gradually increased. That was the so-called educational model 1.5. Around 20 years ago Learning Management Systems (LMS) came into being. Academics sought to improve face-to-face learning with the Web. Learning Management Systems are now used by millions of students and academic staff across the world. There was a similar environment for distance and remote learning from print and videos to digital and mobile [1].

Education 2.0. Social. In 2005 web sites increasingly enabled people to interact, create and contribute ideas and photos. It was called the "read-write Web" or Web 2.0. The democratization of the Web reflected the power not just receive, but to add and express opinion. New platforms such as blogs, wikis, sharing sites, and podcasts emerged and became quite important. Web 2.0 technologies started to be adapted to enhance traditional approaches in education. Open education resources and

contents, free information and knowledge became more accessible. Though, some groundwork was done, the key processes of world education were not transformed significantly. New platforms to solve the challenge of volume came about, such as academic integrity and plagiarism. The debate and aspirations about the openness of knowledge began to gather force [2].

Education 3.0. Semantic. Semantics is the science of machine comprehension of text. The World Wide Web inventor Sir Tim Berners-Lee uses the term Semantic Web to describe a complex system of data and information that can be processed by machines. "A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities. Properly designed, the Semantic Web can assist the evolution of human knowledge as a whole" [3]. The huge development of mobile devices and omnipresent Internet access have made the Web 3.0 available anywhere at any time. The Web became super-integrated. As a result, the Internet has become the defining thread of most societies. The Web influences many people's ways of thinking, doing and being, for good and bad. Universities are no longer the only source of learning, and therefore "transmission" alone is insufficient.

The students and the employees of Education 3.0 "live online" with the vast majority highly personalized smart mobile devices, with constant interaction with others. However, the potential for mobile learning, immersive and personalized, had not been realized. Many questions about the traditional models of Higher Education have come to the fore during the gradual move towards Education 4.0. Educational characteristics might include rich, cross-institutional, cross-cultural, educational opportunities within which the learners themselves play a key role. Access and diversity for staff and students have caused the interest in how relevant is the world Higher Education for employability. Students have become more conscious of the ways they are learning, and being taught, of what is an outcome on graduation and preparedness them for the future. There is a rise of the exploration and interest in ways of achieving transformation within institutions and of the potential for working with private companies to share risk and benefits and attract investments.

To consider employability, the revolutions have had a great impact on economics and working lives for 250 years or so. Compared to Web developments, there have been three previous Industrial Revolutions. The First Industrial Revolution (IR), from around 1760, used water and steam power to mechanize production. The impact was mass transportation, mobility of populations, urbanization and factories, and a support to economies. This First IR demonstrated that machines can do some things better than people. Publicly available compulsory schooling slowly began. And there was some appreciation that Higher Education was not just for the nobility. The Second IR used electric power to create mass production – fertilizers, engines, cars, planes and the rise of protection or promotion of the interests of consumers (consumerism). There was growth in education to prepare people for designed roles in their future working lives, but with strong gender and class differences. There was mass education for the industrialized system. The term "knowledge economy" emerged due to the innovations of the "Information Age" (first coined in 1969). That reinforced the links between Research, Higher Education and a country's success. Knowledge and education are often referred to as human capital – a recognition that advancement and value at every level begins with greater reliance on intellectual capacities and capabilities [1]. The Third IR used electronics and information technology to automate production and create global supply chains. In the 1950s, the Third IR brought semiconductors, mainframe computing, personal computing, and the Internet and the Web. There was the Digital Revolution. The move from analogue electronic and mechanical devices to spreading widely digital technology dramatically disrupted nearly all industries and sectors. These technological advances have made the world smaller – elements of information or news need no more than a few milli-seconds to traverse the globe. That ability has exposed many of the serious challenges confronting the graduates of tomorrow. Most universities started to look differently at their recruitment, delivery of learning, and employability.

Thus, the generation of the 4.0 students will wish to be equipped to tackle the world's biggest challenges in addition to their personal careers, and need to be considering their preparation for the new world of work, using all means at their disposal.

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