

## *The 4th Industrial Revolution: A Redefinition of the Role of Higher Education?*

Josefina Bengoechea, Geneva Business School, Switzerland  
Alex Bell, University of Wales Trinity Saint David, United Kingdom

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### **Abstract**

The 4th industrial revolution has begun to change -and will dramatically continue to change- the economy, the society, and the labour market at large. As Frey and Osborne (2013) have pointed out, automatization and digitalization will "destroy" or at least reconfigure, as many as 70% of jobs. While Arntz et al. (2017) do not agree with Frey and Osborne (2013) on the scope of the creative destruction that AI will bring about, they are of the opinion that many routine, repetitive tasks required for the jobs of the future will be taken over by AI, therefore changing the nature of the skills needed by the labour markets of the 21st century. The OECD (2019) points out that demand for higher education continues to rise in most countries (albeit not in the United States after the COVID pandemic). While the percentage of adults who have received tertiary education has risen on average from 35% in 2008 to 44% in 2018, the OECD states clearly that the expansion of higher education will only be sustainable if HEIs give graduates the skills they require for the future, on the one hand, and on the other, if higher education can match the supply of graduates with labour market and social needs (OECD, 2019). While, according to the OECD (2019) the employment rate for college graduates is 9% than for adults who only possess upper secondary education, and the former earn on average 57% more than latter, there is much more demand for some professions than for others. According to the same report, less than 15% of students who start college study engineering, manufacturing, and construction majors, and only 5% study computer science despite the enormous demand for these professionals. Furthermore, women are particularly underrepresented in the aforementioned programs: across the OECD, only 25% of students of these majors are women. This paper reports on the increased attention on the redefinition of the Role of Higher Education in the 21st century and its key implications for the labour market. The paper builds upon a constructivist approach, combining a literature review and research on key publications and academic reports.

Keywords: Labour Market, Digitalization, Employment

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## Introduction

The role of higher education has changed dramatically over the years. While the origins of higher education a millennium ago were to serve the needs of the church, with the advent of the Reformation and the Renaissance, universities became institutions that pursued knowledge for the sake of knowledge itself. However, the role of HEIs changes with the needs and the nature of the society where they are situated. One issue that has gained crucial importance in the age of automatization is whether education should be inquisitive (to satisfy curiosity and the pursuit of knowledge), or acquisitive (to provide graduates with credentials that are valued in the labour market).

Stokes (2015) discusses the relationship between tertiary education and employability. One of the questions this author addresses is whether American universities should have as their primary mission to prepare students for the workforce or to prepare them to be responsible citizens. Furthermore, Stokes (2015) argues that education providers and employers should share the responsibility of preparing students for the labour market, stressing that the business sector in the US is not sufficiently involved in the development of higher education curricula.

Stokes (2015) shares the view of both other scholars and organizations like the OECD that there is a mismatch between what colleges and universities are teaching and the needs of the labour market. One of the HEIs discussed by Stokes (2015) is Georgia Tech, whose graduates have a great demand in the labour market. Georgia Tech collaborates with employers and policymakers, offering its students experiential learning and cocurricular opportunities. In contrast, New York University, a recognized research institution, appears to avoid association with anything related to vocational education.

One of the most relevant topics addressed by Stokes (2015) is competency-based education, which focuses on aligning curricula and assessment with the job skills targeted in the curricula. Moreover, competency-based education enables students to earn college credits based on their experience or competences. Stokes (2015) points out that HEIs that partner with employers offer students better chances not only for employment, but also for career development.

The issue of employability becomes of paramount importance to prospective students, especially when they have to invest a large sum for obtaining an education and forego earnings during the time spent studying. Cooper (2021) studies the return on investment (ROI) for the median bachelor's degree in the United States. While the OECD report (2019) states that earnings for college graduates are on average 57% higher than earnings for adults with upper secondary education, Cooper (2021) points out that "Four in five engineering programs have ROI above \$500,000, but the same is true for just 1% of psychology programs". Cooper (2021) states that the most important financial decision of a prospective student is not whether to go to college or not, but rather the choice of program: While degrees in engineering and computer science, economics and nursing increase an individual's earnings by USD \$500,000, other programs, like for example art, music, philosophy or psychology, leave students in a worse economic situation than if they hadn't gone to college, and 28% of all study programs offered have a negative return on investment. However, the main reason students give for attending college is precisely to have access to well-paying jobs.

Tertiary education is not free in the United States. However, going to college also implies great costs to students in countries where tertiary education is free of charge, like it is in many European countries: Students who attend college give up other alternatives, like a full-time job, therefore foregoing income and professional experience gained from work.

Obtaining a college education is, for Cooper (2021) an extremely risky investment, especially in countries like the United States or the United Kingdom, where students must also pay a tuition: Between a fourth and a third of students who enroll in higher education drop out of school, not obtaining the benefits of a degree but keeping a huge debt.

Different stakeholders have different perspectives on employability: While, as stated above, the role of the traditional university, in the liberal humanist perspective, was the pursuit of knowledge and learning -which goes beyond the acquisition of practical skills- globalization, internationalization and the notable increase in the number of private actors in the higher education market, the role of higher education is being redefined (Cheng et al., 2021). For Cheng et al. (2021) there is a difference between employment and employability: While employment measures only actual job acquisition, employability measures the potential a graduate has to obtain and function in a job. In other words, employability goes beyond employment. Cheng et al. (2021) point out that, according to a study carried out in England in 2018, obtaining a higher education does not increase an individual's job opportunities in terms of obtaining a job; however, tertiary education increases the chances of an individual of performing a job. For Cheng et al. (2021) employability does not only depend on HEIs, but also on students, government and employers. While governments measure HEIs in terms of the employability of their graduates, the main responsibility for employability lies in HEIs.

Like for American students, the main reason for British students for pursuing higher education is having better opportunities in the labour market. However, for students from other European countries, employability is not limited to finding a job, but includes the ability to start an own business and to succeed in their occupations. This is of special importance in the age of the gig economy.

Cheng et al. (2021) state that employers value candidates who possess the ability to learn besides generic skills like problem-solving, critical thinking and teamwork. Furthermore, employers emphasize the importance of soft skills, which points to an area of disconnection between HEIs, government, and students, who appear to focus on hard- or vocational skills. Nowadays, degrees or qualifications are no longer the core criteria for employability. Employers in the United Kingdom are of the opinion that the responsibility for employability should be shared among students, HEIs, and employers, and that students should assume a greater responsibility for increasing their employability (Cheng et al., 2021).

The focus employability stresses the acquisitive nature of tertiary in the 21st century: As Cheng et al. (2021) put it, employability as the most important criterion of higher education reflects a culture of consumerism and commodification where investment returns become the main driver of HEIs and not expanding knowledge.

### **Is Higher Education in tune with the 4<sup>th</sup> industrial revolution?**

Levine and Van Pelt (2021) state that higher education was transformed in the 19th and 20th centuries to serve the needs of a national, emerging, analog, industrial economy. The economy of today is global, digital and knowledge based. Profound changes that will disrupt

higher education will take place, making the traditional models obsolete and forcing colleges and universities to close down.

For Levine and Van Pelt (2021), this transformation will occur mainly in 3 places: in the post-secondary educational sector that exists beyond colleges and universities; in new colleges and universities that offer competency-based online education, and in continuing education units of financially troubled institutions. The first sector includes organizations that reject time- and place-based education. These will offer low-cost degrees based on educational outcomes. Examples of this sector are corporate media companies, libraries, and museums.

The second sector includes universities that are accessible and affordable, like the University of the People; and examples of the third sector are units within universities that provide short- or part-time courses for graduates.

Levine and Van Pelt (2021) state that there will be a shift from seat-time to learning outcomes: education will no longer be measured in the number of semesters an individual studies, but rather on skill acquisition: There has been a substantial expansion of programs which instead of degrees award micro-credentials.

The transformation of higher education will be rooted in outcomes rather than in time and process. As Levine and Van Pelt (2021) put it: “The initiatives observed at the margins ... of higher education... point to a future that is outcome-based, time-independent, digital, individualized, low-cost, and available at any time and place.”

Levine and Van Pelt (2021) mention 5 new realities that HEIs must brace for, which are: 1) The entry of new content producers and distributors into the marketplace. These are cheaper and more flexible than traditional colleges; 2) A decrease of the institutional control of higher education as a result of the digital revolution, which will empower the learner with more choices; 3) Customers will expect from HEIs what they get from the music, movie and newspaper industries, which will translate into more accessible and more personalized education that best fits their needs; 4) A new model based on outcomes will replace the industrial era model of higher education based on process, or number of semesters attended; and 5) An increase of non-degree certifications and “just-in-time” education as a result of the need for upskilling and re-skilling. Examples of these are “micro-credentials” closely aligned with the dynamic needs of the labour market.

## **Conclusion**

The creative disruption brought about by automation and digitalization is already visible in the labour market, and as Frey and Osborne (2013) prove in their study, it will only increase. Many jobs that require repetitive, routine tasks will either disappear or be reconfigured, as new skills will be needed, and routine tasks become automated.

The percentage of adults who have obtained a higher education has increased from 35% in 2008 to 44% in 2018 (OECD, 2019). However, the OECD has pointed out that, in order for higher education to be sustainable, it must provide students with the skills needed by the labour market and the society. In other words, the nature of education in the 21st century is more acquisitive than inquisitive, having the satisfaction of social and economic needs as priority. Research of university-industry cooperation in different countries has proven that

some HEIs have strong cooperation schemes with industry, while others do not. Cooperation between HEIs and industry is pivotal if the existing mismatch of skills is to be overcome.

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