
Introduction

Higher education has major challenges ahead. The technological revolution could profoundly change the demand for university studies and teaching methodology; new alternative players to traditional universities could also emerge. But we've been here before, and the changes have been really small. Will this time be different?

Some indications show that it might be. Online learning and distance education have moved from a secondary alternative to an integral part of the education system. Digital platforms offer access to educational resources on an unprecedented scale, breaking down geographical and economic barriers, and democratizing knowledge. Are our educational institutions and pedagogical models ready to take full advantage of these tools?

Globalization has made the world more interconnected. Universities no longer compete only at the local or national level, but on a global stage. Students seek educational experiences that prepare them for an international job market, where cultural diversity and competition are the norm. At the same time, nativist tendencies and rejection of the international global order are everywhere. How can our universities adapt to offer relevant education not only locally, but also in a global context?

In parallel, the nature of work is changing. Automation and artificial intelligence are redefining the jobs and skills needed for the future. In an ideal world, universities should rethink their curricula to prepare for the new economy. But do we know which direction to go in? Do we need to be more technical, or will generative AI already do that? More specialized, or more generalist?

Finally, demographic trends and climate crisis portend unflattering fiscal scenarios in the coming decades. How will universities adapt if states decrease (or withdraw) from public funding of universities, which is dominant in much of the world?

In this book we want to reflect on how universities should face these challenges and also the problems they have traditionally faced such as funding and their own governance. The book is structured in four parts.

Part I addresses how internationalization and digital transformation and artificial intelligence are going to affect teaching in universities and how universities should design their educational strategies.

The first chapter by **Parama Chaudhury** and **Cloda Jenkins** looks at how universities globally, but in more detail those in the UK, have responded to the various crises since the COVID-19 pandemic and also how they are coping with technological transformation. The chapter illustrates that despite the negative effects the pandemic had on the educational community, it also brought positive changes at the organizational level such as the acceleration of the digitization of universities. The main consequence of this experience is the need for universities to design organizational systems that are capable of adapting to a changing context. It is also important for universities to generate value locally but to be able to compete and train globally. To this end, the diversity of faculties and students is fundamental.

Mariano Fernández Enguita's contribution reflects specifically on how digitalization and, in particular, artificial intelligence will change university education. To do so, he analyzes the different technological revolutions that universities have faced since the introduction of the printing press, to conclude that they have all had positive and negative aspects, but that many of them have not significantly altered how knowledge is transmitted in universities. However, artificial intelligence (AI) can have a major transformative effect on learning and teaching processes and their organizational architecture. The reason is that AI can provide the ability to personalize teaching and to do so in an integrated way.

Technological changes are challenging all university disciplines, but they are affecting the various fields of study unevenly. **Juan Luis Suárez** documents with data from Canadian universities the decline in demand for humanities studies. This diagnosis contrasts with the need for the humanities to be able to assimilate and integrate technological advances positively in our society. In the author's words, which we share, the humanities are more necessary than ever and therefore new strategies are needed. In particular, he proposes to use AI as a transforming lever for humanities studies, which should change the design of their degrees to enhance complementarity with technology.

Part II of this book is devoted to the interaction between the university, the labor market, research, and the productivity of the economy. The first chapter by **José Ignacio Conde-Ruiz**, **Juan José Ganuza**, **Manu García** and **Carlos Victoria**, begins with an analysis of the evolution of the demand for university studies in Spain over the last three decades, where important gender differences in the choice of degrees are found. The central part of the contribution focuses on the development of three indexes (RTI index, routine task intensity), artificial intelligence (AI) exposure index and software exposure index that measure the exposure of different university degrees to technological

change. The indices are constructed using similar indices for the labor market that exist in the literature (which measure the possibility of replacement by technology of different occupations and also complementarity) and a database that relates university degrees to occupations. These indexes allow sorting of studies by the degree of threat or complementarity with digitization and AI, and are very informative in explaining both the employability and the salary of different studies.

Along the same lines, in the chapter by **Juan F. Jimeno** and **Ana Lamo** they point out that the impact of technological change on employment depends on the complementarity of job profiles with robotics and AI. Using European data, they analyze the impact of technological change at the beginning of the last decade and find a skill bias. The complementarity between technology and technology and labor is higher for skilled workers than for unskilled workers. Employment and wages rose more in occupations with a relatively higher proportion of young and skilled workers. Based on this result, the authors discuss what type of studies should be further invested in, in order to take advantage of the complementarities between new technologies and human capital. However, the authors caution that the emergence of generative AI with more generalist skills may be more disruptive in job substitution.

The chapter by **Aitor Lacuesta**, **Marta Martínez-Matute**, **Jorge Sainz** and **Ismael Sanz** complements the study of university demand with an analysis of changes in supply in the face of a structural change in the labor market. The authors demonstrate with data on Spain that, in line with the evidence shown in previous literature, the demand for university studies is partly determined by earnings expectations. As a reaction to the heterogeneity in future earnings of the different degrees, the cut-off grades (which are an indicator of increased demand) increased for studies with higher expected salaries, and applications to study in communities other than one's habitual residence also increased. In contrast, the supply of places in public universities did not change with respect to the expected results of each type of studies in the labor market. This potential mismatch between supply and demand is aggravated by the universities' strategy of increasing the number of courses offered without increasing the number of places in courses with excess demand.

Miguel Urquiola closes this part with a reflection on the role that university research should play in society. The chapter begins by showing historical evidence of the positive impact of university research on the development of countries. Since the data suggest these positive causal effects of research on welfare, the second part of the chapter focuses on

the strategies that need to be implemented and the aspects that need to be improved to boost research within the university system: i) attracting and retaining a research talent base; ii) measuring research performance; iii) securing public funding and popular and political support, iv), creating incentives and recognition for high quality research, etc....

Part III deals with funding, equity, and diversity in the university. Undoubtedly, the future will bring financial difficulties for the state and individuals. Whether due to the passage of time of universities, or the effects of climate change or technological transformation. The university does not cease to be an expense that affects a minority of the population, which does not even have that much participation in elections. And what can we do in this context?

Stefania Paredes-Fuentes discusses the importance of embracing diversity and creating inclusive environments by breaking down the exclusive “ivory walls” of academia. The chapter, based on personal experience in UK academia and experience in promoting diversity, provides practical strategies for building inclusive academic communities. It emphasizes understanding the negative impacts of a lack of diversity, clarifies the meanings of diversity and inclusion, and suggests ways for individuals to contribute through behavior and teaching practices. While individual efforts are crucial, structural support from universities is also necessary. Having adequate resources is vital to avoid competition and tension among staff.

Antonio Cabrales, Maia Güell, Rocío Madera and Analía Viola argue that given the financial challenges we have mentioned, there is a need for change. Financial challenges mentioned above, funding needs to be changed. Current tuition rates, evenly distributed across income levels. To address this, the chapter advocates income-contingent loans (ICLs), which are flexible and progressive. These loans allow students to pay fees with government loans, repaid based on post-graduation income, easing the financial burden on those with lower incomes. The study uses Spain as a case study, highlighting its fiscal constraints and labor market challenges, and suggests that adopting a system similar to the UK ICL model could improve university funding, reduce regressive impacts and improve access to education.

José García Montalvo and José Montalbán Castilla begin by noting that, in recent years, private investment in Spanish universities has soared, with notable acquisitions such as Permira’s purchase of Universidad Europea de Madrid for €770 million and CVC’s acquisition of Universidad Alfonso X el Sabio for €1.1 billion. This trend contrasts sharply with the decline in enrolment at public universities over the past two

decades, while enrolment at private universities has increased significantly. As a result, the percentage of students at private institutions has doubled. Despite being traditionally considered superior, public universities now struggle to compete due to regulatory restrictions, lack of flexibility and insufficient funding. In contrast to proactive measures taken by the Obama administration in the United States to increase transparency and incentivize public universities based on performance, Spain has responded by tightening regulations on private institutions. The chapter compares various models of higher education funding, emphasizing the current challenges faced by Spanish public universities in adapting to the competitive landscape.

The book closes with a couple of contributions on the crucial issue of how universities are governed. There is little point in having resources or excellent professionals if managers make disastrous decisions.

Carles Ramió points out that the effectiveness of universities depends on their ability to balance autonomy, funding, governance and the quality of teaching and research. Public and private universities have different models for achieving this balance, each with its own strengths and weaknesses. In any case, it appears that universities must adapt to the changing demands of students and society by embracing innovation in teaching and research. For example, a strong emphasis on quality teaching, combined with a commitment to research, is essential for universities to remain competitive in the global marketplace. In this context, effective governance and funding models are critical for universities to fulfil their mission and achieve their goals.

In the epilogue, **Rolf Tarrach** wonders whether it is worth continuing to write about Spanish universities given the extensive literature but gives us his view based on experience with European university systems. While Spanish universities rank well in terms of funding, important problems persist, such as misinformed comparative statistics and neglected gender disparities. He insists on key global issues, such as AI in education and academic rankings. It also stresses the critical role of primary and secondary education in shaping future university success, advocating for greater support and better compensation for teachers at these critical stages.

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