

SCCS Perspectives: Public Universities Facing the Leading Change: Public Universities Facing the Great Labor Transition

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Leading Change: Public Universities Facing the Great Labor Transition

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Summary

McKinsey Global Institute's report, "[A New Future of Work: The Race to Deploy AI and Raise Skills in Europe and Beyond](#)," highlights that Europe could need up to 12 million occupational transitions by 2030 due to automation and the adoption of artificial intelligence (AI). This phenomenon represents a major AI-driven Occupational Transition, which will profoundly transform the structure of the labor market and the skills required.

This paper focuses on the specific implications for Spain, framed in the European context. Despite the potential of Spanish public universities to lead retraining and continuing education programs, their current capacity to do so is exceptionally low. The reasons include rigid bureaucratic structures, inadequate funding, disconnection with the business sector and lack of technological infrastructure.

The implications of not adequately managing these transitions are significant, including increased unemployment and underemployment, loss of income, increased social inequality and intergenerational tensions. In addition, the political and social costs can manifest themselves in the form of social and political unrest, pressure on social welfare policies.

To mitigate these risks, several strategies are proposed, including structural reforms in universities, increased funding for continuing education, strengthening university-industry collaboration and upgrading technological infrastructures.

The paper concludes that Spain's ability to manage this major Labor Transition will determine its global competitiveness and its ability to maintain and improve its position in the 21st century economy.

Introduction

The era of digitalization has radically transformed all areas of our society, and now, we are on the threshold of an equally impactful transition: the artificial intelligence (AI)-driven job transition.

As AI and automation advance, Europe could need as many as 12 million occupational transitions by 2030, according to forecasts in a McKinsey Global Institute report titled "*A New Future of Work: The Race to Deploy AI and Raise Skills in Europe and Beyond*." This transformation is not simply a technological shift, but a profound change in the structure of the labor market and the skills needed to thrive in it. [Numerous data](#) are indicative of the changes ahead: sectors with higher AI integration are experiencing a significant increase in labor productivity, which is about five times higher than in other sectors; jobs demanding specialized AI skills are accompanied by wage premiums of up to 25%; since 2016, the growth of specialized AI jobs has far outpaced that of all jobs, showing a 3.5-fold increase in the number of positions. In addition, the skills demanded by employers are changing at a 25% faster rate in professions that require the use of AI. To stay relevant in this evolving context, workers in these fields will need to acquire and demonstrate new skills.

To all of this we must add the consideration that automation and the adoption of generative AI have the potential to automate up to 30% of hours worked today, posing significant challenges and opportunities. Occupational transitions will be essential for workers to adapt to these changes. However, the critical question is whether Spain, in the context of the European environment, will be able to manage these transitions effectively. The implications for the Spanish economy and for millions of workers whose skills become obsolete are profound.

This paper explores these issues, highlighting the crucial role of retraining and continuing education programs. In particular, it examines the capacity of Spanish public universities to respond adequately to these needs. Despite their potential to lead in this area, public universities in Spain face significant challenges, such as rigid bureaucratic structures, insufficient funding, disconnection with the business sector and lack of adequate technological infrastructure, coupled with complex long-term recruitment systems based on dispositive and rigid knowledge, with limited appreciation of change management skills.

Success or failure in managing these transitions will not only affect Spain's global competitiveness, but also the distribution of wealth, innovation and social welfare. Spanish public universities, with the right support and the necessary reforms, can play a vital role in preparing the workforce for the future. This paper analyzes these dynamics and proposes strategies to mitigate the associated risks and maximize the opportunities offered by the Labor Transition in the age of AI.

The ability of Spanish public universities to manage occupational transitions

Spanish public universities face numerous challenges in responding to the needs of professional retraining and continuing education. Despite their potential, these institutions

show an exceptionally low capacity to adapt to rapid technological changes and labor market demands. Several factors contribute to this situation:

1. *Rigid and bureaucratic structures.* Public universities in Spain operate under organizational and administrative structures that tend to be inflexible and procedural. These structures make it difficult to implement continuous training programs that are agile and adaptive. Slow approval of new curricula is one of the main obstacles; the processes for introducing changes in educational programs can be lengthy and complicated, preventing rapid adaptation to new labor market demands and technological advances. In addition, the lack of autonomy limits the capacity of universities to make effective decisions, restricting their ability to innovate and respond adequately to emerging training needs.

Inadequate funding. Funding for continuing education and retraining programs in Spanish public universities is insufficient. These institutions rely heavily on public budgets, which often do not prioritize continuing education over other more immediate expenditures. The scarcity of financial resources limits the ability of universities to develop, implement and maintain robust, high-quality continuing education programs. Without adequate funding, it is difficult to invest in the necessary resources, such as specialized personnel, advanced technology and up-to-date educational materials, which reduces the effectiveness and reach of these programs. For example, micro-credentialing systems ([MicroCreds Plan](#)), despite their positive aspects, present a significant limitation due to their excessively short-term focus and dependence on non-structural funds, which compromises their long-term permanence.

The financing of training courses is mainly oriented towards efficiency, trying to maximize the cost-benefit ratio in the use of resources. However, this approach often neglects effectiveness, i.e., the actual ability to achieve the desired educational objectives. The delivery of certain courses, such as those requiring access to advanced technologies like artificial intelligence, is a clear example of this. If the availability of these technological resources is not guaranteed, the courses may be practically useless, which is a poor use of public funds. This imbalance between efficiency and effectiveness reflects a shortcoming in the planning and allocation of resources, where quantitative aspects (such as the number of courses offered and the cost per student) are prioritized over qualitative ones (such as the practical usefulness and educational impact of the courses).

Moreover, this focus on efficiency may be counterproductive in the long run. While immediate savings may be realized, the lack of investment in critical skills for students, such as the ability to interact with and manipulate AI tools, may diminish their competence in an increasingly technological and digitized labor market. This poses a significant challenge for education policy, which must balance resource efficiency with effective educational outcomes, ensuring that investment in education translates into real skills and opportunities for students.

3. *Disconnection with the business sector.* There is a significant disconnection between Spanish public universities and the business sector. This lack of collaboration and communication hinders the alignment of educational programs with the real needs of the labor market. As a result, the training offered by universities is not always relevant or applicable to the current and future demands of the labor market. The absence of synergies

between academia and industry means that educational programs do not benefit from the practical knowledge and experiences of the business sector, which could enrich students' training and improve their employability.

In a more global sense, it is sometimes difficult for universities to attract talent in order to improve their training plans (Shoshana Zuboff 2000) due to rigidities in hiring and the high opportunity cost of sacrificing the high salaries received in the private sector. Attracting talent through the faculty associated with existing remunerations is more than an altruistic and social act on the part of these professionals.

4. Lack of technological infrastructure. Many public universities in Spain face a lack of adequate technological infrastructure, which prevents the effective implementation of training programs in advanced digital and technological skills. Obsolete technological infrastructures hinder the integration of new digital learning tools and platforms, which are essential for modern and relevant training. Without a robust technology infrastructure, universities cannot offer their students the hands-on experience and access to cutting-edge technologies that are crucial in today's world of work. This deficiency limits students' ability to develop advanced technological competencies that are competitive in the global marketplace.

Success or failure in managing occupational transitions will have profound implications for the Spanish economy:

Productivity growth: Successful technology adoption and effective management of labor transitions can have a significant impact on productivity growth. According to the McKinsey Global Institute report (2024), accelerated technology adoption coupled with proactive worker relocation could increase the annual productivity growth rate by up to 3% in Europe by 2030. This improvement in productivity is crucial, as productivity is a key driver of long-term economic growth.

Emerging technologies, such as artificial intelligence (AI), advanced automation and the Internet of Things (IoT), have the potential to transform production processes in all economic sectors. AI, for example, can optimize the supply chain, improve accuracy in manufacturing, and provide real-time predictive analytics, which reduces waste and increases efficiency (Brynjolfsson and McAfee, 2014). In addition, automation of routine tasks allows workers to focus on higher value-added activities, such as innovation and complex problem solving.

To capitalize on these benefits, it is essential that public policies and business strategies focus on facilitating the transition of displaced workers into roles that leverage their skills in new technological areas. Continuous training and retraining are key components of this strategy, ensuring that workers acquire the skills necessary to operate and collaborate with new technologies (Goldin and Katz, 2008).

2. Global competitiveness: Spain's ability to manage occupational transitions will directly influence its global competitiveness. In an increasingly globalized world, economies that can adapt quickly to technological change are better positioned to compete in the international marketplace. Autor, Levy and Murnane (2003) argue that economies that adopt new technologies effectively and quickly can significantly improve their productivity and, therefore, their competitiveness. All this must be framed as an ongoing effort, given the rapid oxidation of the competitive advantages offered by technological resources,

where investment in technology becomes a necessary operating cost, not an investment in capital, as Carr's *Does IT Matter* (2004) brilliantly reflects.

Spain, like other European countries, faces the challenge of integrating advanced technologies into its economic and social fabric. The adoption of AI and automation can not only improve the efficiency of existing industries, but also create new business opportunities and emerging industrial sectors. An economy's ability to innovate and adapt is crucial to maintain and improve its position in the global marketplace. This involves not only the adoption of new technologies, but also investment in education and training to develop a workforce capable of working in an advanced technological environment (Acemoglu and Restrepo, 2018).

3. Wealth distribution and inequality: The way in which labor transitions are managed will also significantly influence wealth distribution and inequality. If not properly managed, labor transitions could exacerbate existing inequalities, creating a larger gap between high and low-skilled workers. Thomas Piketty (2014) in his work "Capital in the Twenty-First Century" highlights that inequalities in wealth distribution may increase in the absence of effective redistributive policies and opportunities for social mobility.

Automation and AI have the potential to polarize the labor market, with increasing demand for high-skilled workers and decreasing demand for routine and low-skilled jobs. This may lead to increased earnings and opportunities for skilled workers, while those with obsolete skills could face stagnant or declining wages and higher unemployment. Those economic models based on knowledge and information intensity may experience major changes in their economic activity; those jobs that are more knowledge-intensive may see a decline in their economic activity, while those jobs that are more knowledge-intensive may see a decline in their economic activity. Jobs that are more exposed to the use of new technologies will experience exponential wage increases that could, on the whole, increase income inequality, an inequality that, without being criticized for its social contribution, could lead to inadequate responses by political models based on a posteriori (and forced) redistribution of wealth.

Thus, public policies should focus on providing equitable access to education and lifelong learning, as well as implementing social protection systems that support workers during transitions (Atkinson, 2015). This could avoid painful ex-post redistributions of wealth that could harm economic growth and the creativity of certain economic agents.

4. Innovation and entrepreneurship: The ability to manage job transitions can foster an environment conducive to innovation and entrepreneurship. When workers are relocated to new industries, they bring with them diverse experiences and skills that can drive innovation and new venture creation. Acemoglu and Restrepo (2018) argue that technological innovation, when properly managed, can be a key driver of economic growth and job creation.

Support for continuous training and retraining not only helps workers adapt to change, but can also foster a culture of entrepreneurship and creativity. Training programs that include entrepreneurial and management skills can enable workers to identify business opportunities and launch new enterprises. In addition, policies that facilitate access to financing, support for *startups* and the creation of innovation ecosystems can create a dynamic environment where innovation and entrepreneurship thrive (Schumpeter, 1942). And in this regard we must consider that the proposals for change proposed in the new AI

model may not be explained by classical Schumpeterian models, which assume that technological change does not have such an accelerated development as we seem to have today.

In summary, effective management of labor transitions in the context of AI and automation is not only essential to mitigate the risks of unemployment and inequality, but can also be a catalyst for productivity growth, global competitiveness, and innovation and entrepreneurship. Policies and strategies that support these transitions will have a profound impact on the economic and social structure of Spain and Europe as a whole.

For the millions of Spaniards whose skills become obsolete, failure to achieve the occupational transition objectives would have serious consequences. Many of them will not understand the reasons for this situation, which could have important social and political implications.

Unemployment and underemployment: The inability to make effective occupational transitions can result in high levels of unemployment and underemployment, particularly in an environment where automation and artificial intelligence (AI) are rapidly transforming the labor market. Workers with obsolete skills are in a vulnerable situation, as they may find it difficult to re-enter the labor market, especially in sectors where demand has decreased due to automation.

Automation can displace workers in routine and manual roles, decreasing the demand for tasks that can be easily mechanized or managed by artificial intelligence. Autor et al. (2003) note that automation disproportionately affects workers in middle-skill occupations, such as manufacturing and administrative services. These workers, lacking advanced skills, may find themselves unemployed or underemployed, occupying positions that neither take full advantage of their capabilities nor offer sufficient income. The skills needed must be based on the ability to adapt to change, rather than relying solely on accumulated knowledge, which may not be fully useful in the new paradigm.

This phenomenon not only affects individuals, but also has significant repercussions for the economy as a whole. High unemployment can increase the burden on social welfare systems and decrease the tax base, reducing the tax revenues needed to finance public programs. Social (and political again) problems may be complex to define now, but we can assume that they may be polarized by certain sectors.

Loss of income: Unemployment and underemployment also lead to a significant loss of income for the individuals affected, which has multiplier effects on the economy. When workers lose their jobs or must accept lower-skilled and lower-paid jobs, their income decreases significantly. This loss of income directly affects their ability to consume goods and services, which in turn negatively impacts aggregate demand.

A decline in consumption can have a ripple effect on the economy, affecting businesses that rely on consumer spending to generate revenue. From a Keynesian perspective, aggregate demand is a crucial driver of economic growth; therefore, a drop in consumption can lead to an economic slowdown. Businesses, faced with lower revenues, may reduce their investment in expansion and hiring, further exacerbating unemployment and underemployment problems.

In addition, the loss of income reduces the capacity of families to save and invest in education and continuous training, perpetuating a cycle of low economic mobility and limited opportunities (Mankiw, 2014). Society could become more polarized, to the extent that sectors with the capacity to afford the investments in training that the new model requires would increase their incomes significantly, increasing wage differentials.

Social inequality: Lack of successful occupational transitions can exacerbate social inequalities. Wilkinson and Pickett (2010) demonstrate that economic and social inequalities have adverse effects on a variety of well-being indicators, from health to social cohesion. Those with limited access to continuing education and training are disadvantaged, perpetuating cycles of poverty and social exclusion, as discussed above.

Unequal access to training and new job opportunities means that low-skilled workers are less likely to be able to improve their economic circumstances. Piketty (2014) argues that capital accumulation and differences in education are key factors that perpetuate inequality. In a context of rapid automation and technological change, the lack of effective policies to facilitate training and retraining can further widen the gap between highly skilled workers and those with obsolete skills.

Mental health and well-being: Unemployment and underemployment have profound implications for individuals' mental health and well-being. Job insecurity and lack of opportunity can lead to higher levels of stress, anxiety, and other mental health problems. Marmot (2004) emphasizes that socioeconomic status and job security are important determinants of mental health.

Job insecurity can cause a sense of uncertainty and lack of control over one's future, which increases the risk of anxiety disorders and depression. In addition, the stigma associated with unemployment can affect self-esteem and personal identity, exacerbating mental health problems. Research has shown that prolonged unemployment is associated with a decline in physical and mental health, increasing the incidence of chronic diseases and reducing life expectancy (Jahoda, 1982).

The impact of unemployment and underemployment on mental health also has economic consequences, as it can increase health care costs and reduce labor productivity. It is crucial to implement policies that not only address the economic needs of the unemployed, but also provide psychological support and wellness programs to mitigate these negative effects.

Political and social costs

The great *Labor Transition* driven by AI and automation not only has economic implications, but also profound political and social consequences. Public, and probably also private universities when subjected to the same public evaluation criteria could face serious challenges that transcend academia, as they are unable to adapt quickly to the new demands of the labor market. These costs range from social discontent to the fragmentation of social cohesion, affecting all strata of society.

In the political arena, the inability to adequately manage occupational transitions could fuel populist and extremist movements, increase pressure on social welfare systems and generate intergenerational tensions.

At the societal level, labor market polarization can lead to greater digital exclusion, downward social mobility and erosion of the community fabric.

Social and political discontent: The inability to adequately manage occupational transitions can lead to growing social and political discontent, fueling populist and extremist movements. Population groups with obsolete skills may feel abandoned by technological progress, exacerbating their frustration and resentment towards technological and globalization policies.

Inglehart and Norris (2016) explain that social and political discontent increases when large segments of the population perceive that the benefits of technological and economic change are not distributed equitably. This sense of exclusion can translate into growing support for populist and extremist movements that promise to reverse globalization and technological policies. These movements often exploit the fear and uncertainty experienced by affected individuals, proposing simplistic and protectionist solutions that can have negative consequences for the economy as a whole.

Social discontent can manifest itself in protests, strikes and increased political polarization, making governance and the implementation of effective policies more difficult. Mistrust of political and economic institutions can grow, weakening social cohesion and political stability. In contexts where governments fail to effectively address the needs of displaced workers, the risk of social instability increases, negatively affecting the investment climate and economic development (Gidron and Hall, 2017).

2. Pressure on social welfare policies: High levels of unemployment and underemployment resulting from poor management of occupational transitions will put significant pressure on social welfare systems. The demand for unemployment benefits, social assistance and other support programs will increase, which may lead to political debates about the financial sustainability of these systems.

The literature suggests that social welfare systems are essential to mitigate the negative effects of unemployment and underemployment (Esping-Andersen, 1990). However, when the demand for these services increases considerably, the available resources may not be sufficient to cover all needs. This can lead to a deterioration in the quality and availability of welfare services, exacerbating social and economic inequalities.

Debates about the financial sustainability of welfare systems can polarize public opinion and lead to unpopular reforms, such as reducing benefits or tightening eligibility criteria. These reforms may, in turn, increase the vulnerability of already disadvantaged groups, perpetuating a cycle of poverty and social exclusion (Streeck and Thelen, 2005).

In addition, pressure on welfare systems can divert resources from other important areas, such as education and infrastructure, negatively affecting long-term economic growth. The inability to adequately balance social protection with economic viability can weaken trust in public institutions and undermine social cohesion (Pierson, 2001).

3. Intergenerational tensions: The mismatch between the education of the youth population and the demands of the labor market can generate intergenerational tensions. Young people may feel frustrated by the lack of adequate job opportunities despite having a formal education, which may result in a loss of trust in educational institutions and the political system.

Pierre Bourdieu (1986) argues that education is a cultural capital that should enable young people to access better job opportunities. However, when education does not translate into satisfying and well-paying jobs, young people may feel that they have been cheated by the system. This disconnect can lead to deep disillusionment with the value of education and the promises of social mobility.

Intergenerational tensions can arise when, for primarily electoral motives, public resources are disproportionately allocated to support older generations, leaving younger people without the support they need to develop professionally and personally. In a context of limited resources, welfare policies that primarily benefit retirees may be perceived as unfair by younger generations, exacerbating intergenerational divides (North and Fiske, 2016).

Moreover, there is a possibility that the main poles of the "new productivity" are to be found among the older generations, due to their ability to exploit a knowledge-intensive environment because of their greater experience. In the new technological models, we have moved from needing to interpret how machines think to machines being able to understand us. In this environment, those who have the right questions, based on experience, will be able to obtain the necessary answers; while those who lack those questions, derived from experience, will not be able to take full advantage of the technological capabilities available.

This situation underscores the importance of designing policies that balance support for all generations, ensuring that both young and old can benefit from economic and technological progress, and contributing to a more just and cohesive society. This frustration among young people can manifest itself in reduced participation in democratic processes and the emergence of political movements that challenge the status quo. Disaffected youth may support radical and reformist proposals that promise rapid and drastic changes, which can destabilize the political system and make governance more difficult (Norris, 2002).

The great *Labor Transition* also poses profound social challenges. Labor market polarization can result in significant social fragmentation, where different population groups experience very different economic and social realities, eroding community cohesion and increasing inequality. The rapid adoption of advanced technologies can intensify digital exclusion, leaving behind those without access to technology or the skills to use it, thus exacerbating existing inequalities. In addition, the inability to adapt to new labor market demands can lead to downward social mobility, where individuals and families become trapped in cycles of poverty and socioeconomic constraints that negatively affect their education, health and future opportunities. Thus, we must consider certain relevant elements of this whole process:

Social fragmentation: labor market polarization can lead to significant social fragmentation, with different population groups experiencing very different economic and social realities. This fragmentation can erode the social fabric and community cohesion, increasing segregation and inequality.

Robert Putnam (2000) in his influential work *Bowling Alone: The Collapse and Revival of American Community*, argues that social cohesion and social capital are fundamental to the well-being of communities. When the labor market becomes polarized, and certain groups are excluded from economic opportunities, fragmentation occurs that negatively

affects social cohesion. Unequal access to quality jobs and to the training needed to adapt to new technologies contributes to this fragmentation.

This occupational and economic segregation can lead to the creation of "two societies" within the same community: one composed of those with access to well-paying jobs and advanced skills, and another composed of those in precarious or unemployed jobs, without the skills necessary to compete in the new labor market. This division is not only economic, but also social and cultural, and can manifest itself in different areas, such as education, housing and political participation (Wilkinson & Pickett, 2010).

Social fragmentation weakens community ties and reduces the ability of communities to mobilize collectively in pursuit of common goals. This can lead to increased distrust and cynicism towards political and economic institutions, affecting social stability and governance (Putnam, 2000).

2. Digital exclusion: The rapid adoption of advanced technologies can exacerbate digital exclusion, leaving behind those who do not have access to technology or the skills to use it. This digital exclusion exacerbates existing inequalities and creates additional barriers to economic and social inclusion.

Digital exclusion refers to the gap between those who have access to digital technologies and those who do not. This gap can be caused by economic, educational, geographic or demographic factors. Those who do not have access to technology or lack the necessary digital skills are at a disadvantage in an increasingly technology-dependent labor market (Van Dijk, 2005). For example, children from low-income families should go more to public libraries to compensate for the lack of technological resources in their homes, but often the opposite is true. The educational level of parents, closely linked to income, generates in their children a greater sensitivity to culture and technology, which exacerbates socioeconomic differences. Income transfer or education policies may have little impact if they do not address these underlying cultural and educational barriers.

Digital exclusion not only limits employment opportunities, but also affects individuals' ability to access essential services such as education, health care and banking. In the educational context, for example, students without access to high-speed internet or appropriate devices may fall behind in their learning, perpetuating educational inequalities (Hargittai, 2003). In addition, digital exclusion can lead to unequal participation in the digital economy. People without advanced digital skills may be unable to take advantage of employment opportunities in high-growth technology sectors, exacerbating economic inequality. Lack of digital inclusion may also affect civic and political participation, as more and more democratic processes and citizen participation take place on digital platforms (Norris, 2001).

It is critical to recognize that digital exclusion is not only a question of physical access to devices and the internet, but also of skills and digital literacy. Families with higher incomes tend to have an environment that values and encourages more creative and productive use of technology, giving their children a significant advantage. In contrast, children from families with fewer resources may not receive the same encouragement or access, perpetuating a cycle of inequality. Although young people from all social groups spend a large portion of their time watching videos on their cell phones or interacting on social networks, the actual use of technology may be very different. Rather than focusing solely

on limiting screen time, it is crucial to improve the quality of their use, directing young people towards activities that develop their skills and knowledge.

To address this gap, public policies should focus not only on providing technology, but also on fostering digital education and creating environments that promote productive and healthy use of these tools. This could include digital literacy programs in low-income communities, improving access to technological resources in safe public spaces such as libraries, where social interaction can be encouraged both physically and digitally, and the inclusion of digital skills in the educational curriculum from an early age. This is the only way to effectively reduce the digital divide and ensure a more equitable participation in the labor market of the future.

Downward social mobility: The inability to adapt to new labor market demands can result in downward social mobility for broad social groups, especially among the most disadvantaged. This causes individuals and families to move down the socioeconomic ladder, with lasting effects on the education, health and future opportunities of the affected generations.

Downward social mobility occurs when people experience a fall in their socioeconomic status, which may be due to the loss of well-paid jobs, lack of retraining opportunities or the impossibility of accessing jobs in emerging sectors. Piketty (2014) highlights that economic inequalities can be perpetuated across generations, especially if structural barriers prevent upward mobility.

Education is an area where the effects of downward social mobility are particularly evident. Children of families that experience a drop in socioeconomic status have less access to quality educational resources, which affects their academic performance and future opportunities. Lack of access to quality education perpetuates the cycle of poverty and limits the possibilities for upward social mobility (Blanden et al., 2005).

Health is also affected by downward social mobility. People in lower socioeconomic positions tend to have worse health outcomes due to factors such as stress, lack of access to quality health services, and less favorable living conditions (Marmot, 2004). These health disadvantages can affect the ability to work and generate income, perpetuating the cycle of poverty and downward mobility.

The future opportunities of the affected generations are also at risk. Lack of social mobility can lead to a sense of hopelessness and lack of motivation, affecting individuals' ability to invest in their own personal and professional development. Downward social mobility can have a lasting impact on social cohesion and economic stability, creating an environment where inequalities are widened and opportunities are reduced.

Strategies to facilitate occupational transitions

To mitigate the negative consequences and facilitate occupational transitions, several strategies can be implemented, in which we try to give importance to higher education institutions that still have the capacity to cope with change, albeit in the short term.

Among the many challenges facing the Spanish education system is that of facilitating the occupational transitions of university graduates. The high rate of youth unemployment, the increase in demand for new skills and the obsolescence of some degrees require an urgent

and coordinated response from educational institutions, the government and the business sector. In this regard, some strategies are proposed to improve the employability of university graduates and promote upward social mobility. These are:

Structural reforms in public universities: It is crucial to reform the administrative and academic structures of Spanish public universities to make them more flexible and adaptive. Bureaucratic rigidity and lack of administrative autonomy limit the ability of universities to respond quickly to changing labor market demands and technological innovations.

Structural reforms can improve operational efficiency and enable a more agile response to emerging educational needs. However, implementing these changes can be challenging due to resistance to change within institutions, rigid legal frameworks, and the need for political and academic consensus. In addition, structural reform requires a clear vision and a long-term implementation strategy, backed by adequate resources and the commitment of all stakeholders (Streeck & Thelen, 2005).

2. Increased funding for continuing education programs: Increasing funding for continuing education and retraining programs is essential to prepare the workforce for the challenges of the future.

Adequate funding enables universities to develop and implement high quality programs that can respond to the needs of the labor market. Difficulties include competition for limited financial resources, the need to justify the return on investment in continuing education, and effective management of funds. Public-private partnerships can be a solution, but require coordination and clear agreements on objectives and expected results (Esping-Andersen, 1990).

3. Strengthening university-business collaboration: Fostering greater collaboration between universities and the business sector is crucial to ensure that educational programs are aligned with the needs of the labor market.

This collaboration can improve the relevance of educational programs and increase the employability of graduates. Difficulties include differences in the objectives and expectations of universities and companies, as well as the need to establish effective communication and coordination mechanisms. The creation of advisory committees and the implementation of internship and dual training programs can facilitate this collaboration, but require initial investment and ongoing commitment (Pierson, 2001).

4. Updating technological infrastructures: Investing in the modernization of the technological infrastructures of public universities is essential to offer educational programs in advanced digital skills.

Up-to-date technological infrastructures enable universities to provide quality education that prepares students for the jobs of the future. Challenges include the high cost of advanced technologies, the need to train faculty, and rapid technological obsolescence. Without continuous updating, universities risk falling behind, which can affect the quality of education and the employability of graduates (Norris, 2002).

5. Promoting mobility: Facilitating labor mobility at both the geographic and sectoral levels is crucial to help workers find new employment opportunities.

Labor mobility can reduce unemployment and underemployment by allowing workers to move to where their skills are in demand. Difficulties include administrative barriers, differences in certification and recognition of qualifications, and the costs associated with relocation. Policies that support mobility, such as relocation assistance and skills recognition, are essential to overcome these barriers.

6. Support for innovation and entrepreneurship: Promoting a favorable environment for innovation and entrepreneurship can create new employment opportunities and reduce dependence on declining sectors.

Support for innovation and entrepreneurship fosters the creation of new companies and industrial sectors. Challenges include the need for access to finance, the development of an adequate support ecosystem, and the creation of a regulatory environment conducive to innovation. Initiatives such as business incubators and technology parks can be crucial, but require investment and strategic planning (Acemoglu & Restrepo, 2018).

7. Improved social safety nets: Strengthening social safety nets is essential to provide financial support and retraining services to displaced workers.

Robust social safety nets can mitigate the negative effects of unemployment and underemployment by providing temporary livelihoods and facilitating the transition to new jobs. Challenges include the financial sustainability of these programs and the need to balance support with incentives for employment. Universal basic income policies or enhanced unemployment insurance could provide a more robust safety net, but require careful analysis of their economic and political feasibility (Esping-Andersen, 1990).

8. Dual training and internship programs: Implementing and expanding dual training and internship programs in collaboration with companies is essential to prepare students for the labor market.

These programs allow students to gain practical experience while completing their academic training, facilitating a smoother transition to the labor market. Challenges include coordination between universities and companies, the need to adjust educational curricula to incorporate practical components, and ensuring the quality and relevance of internships. Despite these challenges, the benefits of these programs in terms of employability and job readiness are significant (Pierson, 2001).

9. Constantly improve educational content with substantive criteria: It is essential to implement continuous improvement mechanisms for educational content that go beyond formal quality control. Innovating pedagogically and incorporating the latest technological and scientific advances in educational programs ensures that the training provided is relevant and effective. Implementing these improvements requires overcoming resistance to change in the educational community and conducting rigorous evaluations of innovations and their integration into the existing educational framework. It is essential that such evaluations demonstrate how the training contributes to achieving the social goals of public education, and are not limited to specific aspects such as student satisfaction or pass rates (Streeck & Thelen, 2005).

10. Promoting adult education: Creating and promoting adult education programs enables older workers to acquire new skills and adapt to the demands of the labor market.

Adult education is crucial to ensure that all segments of the population can participate in the labor market and adapt to technological changes. Challenges include funding these programs, motivating adults to participate in continuing education, and the need to offer flexible programs that accommodate adults' work and personal responsibilities. Evening courses, online programs, and modular training are effective strategies for overcoming these barriers (Norris, 2002).

Implementing these proposals is critical to ensure that Spain can successfully navigate the great Labor Transition driven by artificial intelligence and automation. Reforming university structures, increasing funding for lifelong learning, strengthening collaboration with the business sector, and modernizing technological infrastructures are critical steps to prepare the workforce of the future. In addition, encouraging labor mobility, supporting innovation and entrepreneurship, and improving social safety nets will provide a robust and resilient environment to meet the challenges of the 21st century. Implementing dual training and internship programs, continuously improving educational content, and promoting adult education will ensure that all segments of the population are equipped to participate in an ever-evolving labor market. Through a strategic and collaborative approach, Spain can not only mitigate the risks associated with technological disruption, but also capitalize on the opportunities this transition presents, ensuring a more inclusive and prosperous future for all its citizens.

Conclusion

Spain, in the context of the European environment, faces a significant challenge in managing millions of occupational transitions needed to adapt to increasing automation and the adoption of artificial intelligence (AI). The ability to do so will have profound implications for the Spanish economy and for the millions of workers whose skills become obsolete due to these technological advances. The coming Labor Transition is not simply a matter of replacing human tasks with machines, but of profoundly transforming the labor market and education systems to meet the demands of an advanced digital economy.

Through structural reforms, investment in education and training, and close collaboration between the public and private sectors, Spain's public universities can play a crucial role in preparing the workforce for the future. Reforming the administrative and academic structures of universities to make them more flexible and adaptive will allow for a more agile response to market needs. Also, increasing funding for continuing education and retraining programs, strengthening university-business collaboration, and upgrading technological infrastructures are essential steps to ensure that the education provided is relevant and of high quality.

Success in managing these transitions will determine whether Spain can maintain and improve its position in the global economy of the 21st century. A well-prepared workforce is critical to attracting investment, fostering innovation and ensuring sustainable economic growth. Decisions made today on how to invest in education and lifelong learning, how to modernize technological infrastructures and how to strengthen social safety nets will be crucial in defining the future of work in Spain.

Moreover, it is vital that these transitions are managed in an inclusive manner to ensure that technological progress benefits all, not just a few. Policies should focus on reducing social and economic inequalities, providing equitable opportunities for all segments of the population. Specific programs to promote adult education, constantly improve educational content with substantive criteria, and support innovation and entrepreneurship will be essential to ensure that all citizens can benefit from new technologies.

In summary, public universities have the opportunity to lead the Labor Transition driven by AI and automation, but it will require a concerted and coordinated effort between them, public administrations and the business sector. Actions taken today will not only define Spain's competitiveness on the global stage, but also the quality of life and well-being of its citizens in the future. It is imperative that policies and strategies are adopted to promote a fair and equitable Labor Transition, ensuring that technological progress translates into shared prosperity.

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