



The Third Mission of Universities as an Institutional Mechanism of ESG Management in the Digital Society

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ABSTRACT

The central thesis of the paper is that the third mission is not only compatible with ESG policies but also provides a key institutional mechanism for implementing environmental, social, and governance (ESG) goals in the digital society mediated by algorithms. The analysis is based on classic and contemporary sociological and political science literature on AI management, higher education, and the knowledge economy, which the author compares with the principles of ESG reporting, relevant policy documents, and third-mission practices, including knowledge transfer, technology dissemination, and civic engagement. The starting point of the interpretation is the model of the triple spiral of relations between universities, industry, and the state, which proves to be a particularly suitable framework for the application of ESG principles. The results indicate that digital technologies destabilize the existing structure of education by blurring the boundary between expertise and technically generated information. In such an environment, universities can no longer act as passive distributors of knowledge but become active actors in shaping a democratic, inclusive, and technologically competent society. Critical thinking and empathy are becoming key competencies for the interpretation of technological systems and the responsible application of ESG standards, which makes the third mission of universities extremely politically relevant.

Keywords: Third mission of universities, ESG compliance, Digital society, Critical thinking.

Introduction

Digital transformation has become one of the key structural processes of the modern age, reshaping how knowledge is created, verified, distributed, and used. This transformation is no longer limited to the technical modernisation of institutional infrastructure or the digitalisation of existing practices. It implies a deeper reconfiguration of the relationship between technology, economy, governance, and society, especially under the accelerated influence of artificial intelligence. As algorithmic systems increasingly mediate access to information, they increasingly influence decision-making processes and redefine the boundaries between expertise and automated output. That is why the institutional frameworks of the so-called *knowledge societies* are facing a thorough review. Within this broader shift, universities occupy a particularly important place as they remain key actors in the formation of cognitive authority, social competence, and public legitimacy, but with a significantly altered mode of operation.

At the same time, the rise of the ESG framework has introduced a new normative system for assessing institutional responsibility in the digital age. Originally developed in the areas of finance, corporate governance, and sustainability reporting (Brooks & Oikonomou, 2018), ESG has gradually expanded beyond the corporate sector and has emerged as a broader framework for assessing how institutions respond to environmental pressures, societal expectations, and governance demands (Gillan *et al.*, 2021; Berg *et al.*, 2022; Gelles, 2023).

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The issues of energy-intensive digital infrastructure, data governance, algorithmic bias, inclusion, transparency, accountability, and public trust are increasingly demonstrating that managing the digital transformation cannot be reduced to technical efficiency alone. It also requires ethical orientation, institutional responsibility, and the ability to align technological development with broader societal goals. In this context, ESG compliance takes on a broader meaning: in addition to formally reporting on the changes, advances made, and regulatory adjustments, it also becomes an answer to the question of how institutions contribute to a sustainable, inclusive, and democratically accountable digital transformation.

An expanded understanding of ESG opens up an important analytical space for rethinking the role of universities in contemporary society. Traditionally, universities have defined themselves through two fundamental missions: teaching and research. However, an increasing number of studies in recent decades have highlighted the importance of the so-called *third mission*, which includes activities through which higher education institutions engage in society, the economy, the civil sector, and public policies beyond their formal educational and scientific functions. This mission includes knowledge transfer, fostering innovation, technology diffusion, civic engagement, regional development, and participation in the public presentation of new ideas and decisions. In the conditions of accelerated digital transformation, the third mission can no longer be seen only as a supplement to academic work. It is increasingly emerging as a key institutional mechanism through which universities mediate between technological systems and social values, between innovation and regulation, and between the production of knowledge and its ethical application in the public space.

The paper starts from the assumption that such institutional mediation is crucial for understanding ESG compliance in the digital society. While the existing literature extensively addresses ESG reporting, sustainable governance, AI ethics, and the civic role of higher education, these areas are often analysed separately rather than integrated. ESG research primarily focuses on corporate actors and partly on the public sector and local government, while educational institutions remain relatively poorly researched as places of implementation of ESG principles. At the same time, the literature on the third mission most often emphasizes innovation ecosystems, university-industry cooperation, or regional development, but less often interprets these practices through the conceptual prism of ESG management. This paper, therefore, links these two research fields by arguing that the third mission of universities provides a key institutional framework for the operationalization of ESG goals in an algorithmically mediated digital society. At the same time, this text has a theoretical-conceptual character and is based on an interpretive synthesis of relevant interdisciplinary literature on ESG management, digital transformation, and the social role of universities.

The main research question of this paper is: ***Can the third mission of universities be seen as a mechanism of ESG compliance in the digital society?***

More specifically, the paper examines how universities, in the conditions of digital transformation driven by artificial intelligence, acquire a new social function through which environmental, social, and governance goals are translated into institutional practices of knowledge transfer, public engagement, and technological responsibility.

The central thesis of this paper is: ***the third mission provides an institutional framework through which universities are transformed from passive distributors of certified knowledge into active actors in shaping democratic, inclusive, and ethically governed digital societies.***

The paper pays special attention to forms of institutional engagement such as knowledge transfer and civic participation, as they are the key places where digital transformation intersects with issues of social responsibility and governance. The paper further relies on *the triple helix* model of university-industry-government relations as a conceptual tool for understanding how ESG goals can be embedded in the broader ecosystem of innovation, education, and regulation. In this perspective, the university is not seen as an isolated educational actor, but as a strategic institution located at the intersection of economic development, technological change, and public normativity.

As generative systems and data-driven forms of classification increasingly shape our everyday lives, the difference between expertise and technically generated information is becoming more and more significant. This transformation has profound implications for the university. It can no longer rely solely on its traditional authority as a repository of specialized knowledge, but must reaffirm its public role through interpretive guidance, ethical reflection, and civic responsibility. In such a framework, critical thinking, empathy, and technological literacy appear not as



complementary educational ideals, but as core competencies for responsible participation in the digital society and for the practical implementation of ESG-oriented management.

Theoretical Framework

The conceptual foundations of this paper are at the centre of three research areas: ESG management research, scientific literature on the social and epistemological implications of digital transformation, and studies dealing with the changed institutional role of universities in the knowledge economy. Linking these research strands allows for a more comprehensive understanding of how universities, in particular through their third mission, can act as institutional intermediaries between technological development and normative frameworks of social responsibility.

The concept of ESG has emerged over the last two decades as the dominant paradigm for assessing institutional responsibility and sustainability in various economic sectors (Fagbemi *et al.*, 2025).

In digital economies, the relevance of ESG management is becoming particularly apparent. The expansion of digital infrastructures, the proliferation of large-scale data processing systems, and the deployment of AI technologies have brought new environmental, social, and governance challenges. At the environmental level, more and more attention is being paid to the energy consumption of data centres, the environmental footprint of cloud infrastructures, and the sustainability of digital supply chains (Belkhir & Elmeligi, 2018; Jones, 2018). Social aspects focus on issues such as digital inclusion, algorithmic discrimination, work transformation, and the social consequences of automated decision-making (O'Neil, 2016; Eubanks, 2018). Governance challenges relate to transparency, accountability, data governance, and regulatory oversight of digital platforms and algorithmic systems (Floridi *et al.*, 2018; Zuboff, 2019). In this context, ESG compliance represents a broader institutional effort to align technological developments with societal expectations of sustainability, fairness, and accountability. As digital transformation increasingly reshapes economic and social structures, ESG management acts as a normative framework that guides the responsible application of new technologies. This change also implies that institutions traditionally associated with the creation of knowledge, such as universities, must be seen not only as educational institutions, but also as actors that participate in the management of technological change.

The rise of digital technologies and artificial intelligence has profoundly changed the conditions in which knowledge is created, distributed, and validated. In modern digital societies, information flows are increasingly mediated by algorithmic systems that generate content on an unprecedented scale. This transformation has significant implications for epistemological authority as the traditional boundaries between expertise, general information, and automated content become increasingly blurred (Floridi, 2014; Kitchin, 2017).

Several authors point out that the emergence of big data-driven infrastructures and machine learning systems is reshaping the educational architecture. Automated systems, in addition to becoming tools for information processing, also actively participate in the construction of knowledge by identifying patterns, generating content, and influencing human behaviour and decision-making (Mayer-Schönberger & Cukier, 2013; Pasquale, 2015). Generative AI systems further intensify this transformation by creating content that mimics expert discourse, thereby challenging the established boundaries between human expertise and machine-generated information (Bender *et al.*, 2021).

Such developments raise important questions about the institutional foundations of knowledge societies. Historically, universities have acted as central institutions in validating and disseminating reliable knowledge. Their legitimacy rested on the institutionalized authority of academic expertise and scientific activity (Merton, 1973; Shapin, 2008). However, in algorithm-mediated environments, knowledge creation is increasingly distributed between digital platforms and educational institutions. As a result, universities can no longer rely solely on their traditional role as sources of expertise.

Instead, their institutional relevance is increasingly manifested in the ability to generate innovations, interpret and contextualize them, and critically evaluate information as well as its social implications. Universities, therefore, emerge as key places where normative dimensions of technological development, such as ethical reflection and democratic accountability, can be articulated and institutionalized. In this sense, digital transformation is not only changing the technological landscape but also redefining the epistemological responsibilities of educational institutions.



The transformation of universities in response to technological and economic changes has been extensively analysed in the literature on the knowledge economy. As economies become increasingly dependent on innovation and human capital, universities have been given a more prominent role in national and regional development strategies (Etzkowitz & Leydesdorff, 2000; Marginson, 2016).

This transformation is conceptualized through several theoretical frameworks, among which the most famous is the model of *the entrepreneurial university*, which emphasizes the increasingly strong involvement of universities in cooperation with industry, technology transfer, and commercialization of research results (Clark, 1998; Etzkowitz, 2003). In this perspective, universities are expected to actively contribute to economic growth by fostering innovation and developing entrepreneurship.

Closely related to this approach is the concept of *the triple helix*, which describes innovation as a result of dynamic interactions between universities, industry, and the state (Etzkowitz & Leydesdorff, 2000). Rather than acting as separate institutional spheres, these actors are increasingly collaborating in hybrid organisational arrangements such as research partnerships, innovation clusters, incubators, and technology transfer networks. The triple helix model, therefore, provides a useful conceptual framework for understanding how knowledge institutions participate in the broader governance structures that shape technological development and economic transformation. These activities include knowledge transfer, technology commercialization, regional development, public engagement, lifelong learning, and participation in public policy advisory processes (Benneworth, 2013; Perkmann *et al.*, 2013).

It is important to emphasize that the third mission must not be interpreted exclusively in economic terms. While many debates emphasise innovation and collaboration with industry, a growing body of research highlights its wider societal dimension. Universities contribute to civic engagement and democratic transitions by enabling dialogue between the world of scientific activity and the public interest (Goddard & Kempton, 2016). Through such activities, universities help translate specialized knowledge into socially relevant forms that can shape public policies and govern the use of modern (AI) technologies, as well as provide a new understanding of scientific work.

As societies become increasingly dependent on complex technological systems, the need for institutions capable of mediating between technical expertise and societal values becomes more pronounced. Universities are uniquely positioned to take on this role because they combine scientific expertise, educational capacity, and institutional legitimacy. Through knowledge transfer initiatives, public engagement programmes, and interdisciplinary research collaborations, universities can contribute to the responsible management of new technologies.

Despite the growing importance of ESG management and the extensive literature on the social role of universities, the two research areas are rarely systematically integrated. Nevertheless, both perspectives share a common interest in institutional accountability, social impact, and the management of technological change. The integration of these perspectives allows for a more complete understanding of how universities can contribute to the sustainable digital transformation. The third mission provides an institutional infrastructure through which universities collaborate with external stakeholders, translate scientific knowledge into practical applications, and participate in public and policy debates. ESG frameworks, on the other hand, provide a normative structure that defines the broader societal goals towards which such activities should be directed. This theoretical integration provides an analytical basis for the argument that the third mission of universities can function as a mechanism through which ESG goals are translated into institutional practices within the digital society.

Materials and Methods

The analysis is based on classic and contemporary sociological and political science literature on AI management, higher education, and the knowledge economy, which the author compares with the principles of ESG reporting, relevant policy documents, and third-mission practices, including knowledge transfer, technology dissemination, and civic engagement. The starting point of the interpretation is the model of the triple spiral of relations between universities, industry, and the state, which proves to be a particularly suitable framework for the application of ESG principles.

Results and Discussion



Digital Transformation and Changing the Role of Universities

Understanding the relationship between ESG principles, digital transformation, and the institutional role of universities requires a conceptual framework that goes beyond the traditional analysis of educational institutions as isolated organizations. In the modern knowledge society, universities operate within complex institutional ecosystems in which technological innovation, public policies, regulatory standards, and societal expectations intertwine. In such an environment, digital transformation is not only a technological modernization of existing structures, but a profound reorganization of the institutional relations between knowledge, the economy, and society (Powell & Snellman, 2004; Castells, 2010).

One of the key consequences of such a transformation is a change in the way societies manage technological development. The development of artificial intelligence, digital platforms, and data infrastructures has created new forms of socio-technical systems, the functioning of which has direct implications for economic development, political decision-making, and social cohesion (Van Dijck *et al.*, 2018). The governance of such systems, therefore, increasingly requires institutional frameworks that can integrate technological innovation with the normative objectives of sustainability, social responsibility, and democratic legitimacy. It is in this context that ESG principles acquire a broader institutional function.

In contemporary literature, ESG is increasingly seen as an instrument of institutional coordination in complex socio-technological systems. Authors such as Schoenmakers and Schramade point out that ESG frameworks act as mechanisms that connect market actors, regulatory institutions, and civil society organizations around common normative sustainable development goals (Schoenmaker & Schramade, 2019).

Similarly, Eccles and Klimenko emphasize that ESG standards are increasingly acting as an infrastructure of institutional trust in the global economy, especially in sectors that rely on intensive technological innovation (Eccles & Klimenko, 2019).

Digital technologies create new forms of economic value, but at the same time raise issues of accountability and governance that go beyond traditional regulatory models. Problems such as the concentration of digital power, algorithmic decision-making, or the management of large amounts of data require institutional mechanisms that can align innovation with societal values (Benkler, 2006; Srnicek, 2017).

In this sense, ESG principles act as a normative framework that allows technological developments to be integrated with the objectives of sustainability, transparency, and social inclusion. However, digital transformation is changing the conditions for achieving this function: the wide availability of information on digital platforms and the development of generative AI are challenging the traditional, linear model of knowledge transfer between professionals and students (Selwyn, 2016; Knox, 2019).

In such circumstances, universities increasingly act as institutional interpreters of technological change. Their role is no longer limited to the transfer of existing knowledge, but also includes the development of the ability to understand complex technological systems and their social implications. That is why education in the digital society increasingly emphasizes the development of competencies that enable responsible management of technology.

Two competencies stand out in particular in contemporary discussions about education in the context of digital transformation: *critical thinking* and *empathy*.

Critical thinking enables analytical understanding of knowledge structures, identification of implicit assumptions, and assessment of the credibility of information in an environment marked by digital data oversaturation (Halpern, 2014; Davies, 2015). In the context of an algorithmic society, such an ability becomes crucial, as it enables an understanding of how digital systems shape public discourse, market processes, and political decision-making.

Empathy, on the other hand, can be seen as the ability to understand the personal experience of life in the digital age, but also as the ability to deeply appreciate the experiences of other members of the community, which can often be significantly different. Unlike algorithmically generated content, empathy is an extremely human trait that arises from an awareness of the social consequences of everyday technological decisions. The development of artificial intelligence and automated decision-making systems shows that technological design often includes implicit value assumptions that can affect individual social groups differently (Benjamin, 2019; Crawford, 2021).

Empathy is therefore becoming a fundamental element of responsible technological development, as it enables the recognition of the social implications of algorithmic systems and their impact on social justice and inclusion.



The introduction of these competencies into the analytical framework makes it possible to link the epistemological function of the university with the institutional goals of ESG. If ESG principles define the normative goals of sustainable and socially responsible development, then educational institutions have a key role to play in developing the intellectual and ethical capacities necessary for their implementation. Through educational programs, universities shape generations of experts who will participate in the management of technological systems, thus directly influencing the institutional implementation of ESG standards.

In addition, universities are increasingly involved in the development of regulatory frameworks for new technologies, in the formulation of ethical guidelines for artificial intelligence, and in public debates on the societal implications of digital transformation. In this way, academic institutions act as intermediaries between technological innovation and social regulation, linking scientific expertise with public decision-making processes (Gulbrandsen & Slipersæter, 2007).

Many authors point out that contemporary innovations increasingly arise in network structures that connect different institutional actors (Carayannis & Campbell, 2009).

The concept of the third mission of universities was created in response to the growing need for academic institutions to participate more actively in social and economic processes beyond their traditional ways of operating (Pinheiro *et al.*, 2012; Compagnucci & Spigarelli, 2020).

In such an institutional context, the third mission of universities can be interpreted as an operational mechanism through which ESG principles are translated into concrete social practices. Through knowledge transfer activities, expert education, and participation in public debates, universities contribute to shaping the institutional environment in which technological innovations are developed in accordance with the principles of sustainability, social responsibility, and transparent governance.

This implies the development of institutional structures that enable the integration of technological innovations with societal values. Universities, owing to their unique position at the crossroads of education, scientific research, and societal engagement, are key institutions in this process. Such an understanding of the institutional role of universities has created the basis for the development of the already-mentioned triple helix model, which represents an institutional framework for the integration of universities, industry, and the state in the process of implementing ESG principles in the digital society (Carayannis & Campbell, 2012; Ranga & Etzkowitz, 2013).

The Conceptual and Institutional Relationship between the University and ESG Principles

ESG principles are increasingly interpreted as a broader normative framework that defines socially responsible management of complex socio-technical systems. The institutional role of universities thus becomes particularly important because it is educational and scientific institutions that participate in shaping the intellectual and organizational capacities necessary for the sustainable transformation of digital societies.

Authors such as Leal Filho *et al.* emphasize that higher education has a special role to play in the integration of the SDGs into the institutional structures of society because universities shape knowledge, professional competencies, and policy ideas that guide social development in the long term (Filho *et al.*, 2018).

A similar argument is developed by Wals and Benavot, who point out that educational institutions represent important platforms for the development of normative and cognitive capacities necessary for the sustainable management of global social systems (Wals & Benavot, 2017).

That is why ESG principles can be seen as an institutional framework that defines new criteria for the social responsibility of organizations, including universities. Illustrative examples from contemporary practice show that some universities are already developing institutional mechanisms that connect the principles of ESG management with the social role of higher education. For example, the University of Pittsburgh has published an institutional ESG report that systematically shows the environmental, social, and governance impacts of its activities, including sustainable campus management strategies, the social impact of research projects, and the transparency of institutional governance. Such documents represent an attempt to engage academic institutions in broader sustainability and social responsibility reporting processes that were previously predominantly developed in the corporate sector (University of Pittsburgh, 2022). At the same time, many universities have developed institutional guidelines for the ethical use of AI in teaching and research. For example, the University of London has adopted a formal framework for the



responsible use of AI that emphasizes transparency, academic integrity, privacy protection, and responsible use of generative technologies in the educational process (University of London, 2023). Such initiatives show that universities, through activities that go beyond the traditional functions of teaching and research, are increasingly actively participating in shaping the normative and institutional frameworks of responsible digital transformation, which empirically confirms the argument that the third mission can act as an operational mechanism for the implementation of ESG principles in the digital society.

From these examples, we can see that universities are not only places of scientific knowledge, but also organizational nodes that connect different social actors in the processes of innovation and institutional change (Howaldt *et al.*, 2018). In the context of ESG, such a function gains additional importance because it enables the integration of technological innovations with social and environmental goals of sustainable development, and, conceptually speaking, the relationship between universities and ESG principles can be analysed through three complementary dimensions: institutional, operational, and normative.

- a) The institutional dimension refers to how universities participate in the innovation ecosystems and regulatory processes that shape the digital transformation. This is especially evident in modern innovation systems based on the cooperation of different organizational actors. Research in innovation studies shows that universities have become key elements of regional and global innovation networks because they possess a unique combination of scientific knowledge, human capital, and organisational capacity (Lundvall, 2010). In such systems, universities often act as intermediaries between scientific research, technological innovation, and public policies, thus contributing to the institutional coordination of different societal actors. It is in this role that universities can contribute to the operationalization of ESG principles. Through research projects, interdisciplinary centres, and partnerships with industry, academic institutions participate in the development of technologies that take into account the environmental and social implications of innovation. At the same time, through educational programs and professional studies, universities are shaping generations of experts who will manage technological and economic systems in the future.
- b) The operational dimension refers to the concrete mechanisms through which universities implement the principles of social responsibility in their educational, research, and social activities. This dimension of the relationship between universities and ESG principles is evident through concrete institutional practices that connect academic knowledge with societal needs. The literature on the social responsibility of universities often emphasizes the *engaged university* concept, highlighting the active role of academic institutions in tackling social issues (Watson *et al.*, 2011). Such an approach implies the development of educational programs focused on sustainable development, cooperation with local communities, and participation in the formulation of public policies. In the context of ESG, such activities can take different forms. For example, universities are involved in the development of standards for the ethical application of AI, in the analysis of the social implications of digital technologies, or in the development of strategies for the sustainable management of urban systems. These activities often take place through interdisciplinary research centres that bring together experts from different fields to jointly develop solutions to complex societal challenges. A particularly important aspect of the operational dimension of ESG relates to the management of institutional practices within the universities themselves. An increasing number of universities are developing sustainable development strategies that include reducing the environmental footprint of campuses, developing inclusive education policies, and transparent management of organizational processes. Such initiatives show that ESG principles act not only as an external regulatory framework, but also as an internal instrument for institutional transformation.
- c) The normative dimension refers to the development of value and ethical frameworks that enable socially responsible technology management. Universities have historically played an important role in shaping public discourse on social values and political ideas. In the digital society, this function takes on new importance, as technological innovations often raise questions that go beyond the technical and economic aspects of development. Authors such as Jasanoff emphasize that the management of new technologies requires the development of the so-called socio-technical imagination, i.e., collective ideas about how technology should serve society (Jasanoff, 2015). Universities have a key role to play in this process, as they



contribute to shaping societal expectations of responsible technological development through research and public debate. In the context of ESG, this normative function is particularly prominent in discussions on the ethics of AI use, digital democracy, and data governance. Academic institutions contribute to developing ethical guidelines, regulatory recommendations, and interdisciplinary research that strive to define socially acceptable ways of applying new technologies. That is why the already mentioned encouragement of young people to critical thinking and empathy, which can and must be inaugurated through the higher education system, has its irreplaceable role within the so-called third mission of universities.

The combination of institutional, operational, and normative dimensions makes it possible to understand how universities can act as key actors in ESG transformation. Through their educational function, universities develop the intellectual competencies necessary to manage technology responsibly. Through research activities, they participate in the development of innovations that take into account the environmental and social implications of technological development. Through the activities of the third mission, they participate in the shaping of public policies and social institutions that regulate technological change.

From all of the above, it follows that the relationship between universities and ESG principles can be seen as a part of a broader institutional transformation of the digital society. Universities no longer act only as passive transmitters of knowledge, but as active participants in the processes of social coordination that shape the direction of technological development. It is through such a transformation that the third mission of universities acquires a new strategic dimension because it becomes a key institutional mechanism for connecting scientific knowledge, social responsibility, and technological innovation. Such an understanding of the institutional role of universities allows for a reinterpretation of ESG principles as a part of a broader system of social governance of digital transformation. Therefore, ESG principles can be seen as a normative framework that defines the way in which different institutions, especially universities, contribute to the sustainable and socially responsible development of the digital society.



Conclusion

The paper starts from the assumption that digital transformation, especially accelerated by the development of artificial intelligence and algorithmically mediated information systems, changes the institutional position of universities in the knowledge society. In such circumstances, universities can no longer be viewed only through their two classical functions – teaching and research – but also through the broader social role that is fulfilled through their third mission. Based on this framework, the paper aimed to bridge two research traditions often analysed separately: ESG management research and studies on the social role of universities.

The central thesis of the paper was that the third mission of universities is not only compatible with ESG policies but also provides a key institutional mechanism through which ESG goals can be operationalized in the digital society. The analysis of the relevant sociological, political science, and economic literature on the knowledge economy, artificial intelligence management, and the transformation of higher education, as well as an overview of the principles of ESG reporting and institutional practices of the third mission, confirmed the analytical and empirical foundation of such an approach. The importance of the triple helix model of university, industry, and state relations was particularly emphasized, which shows how different social actors participate in shaping innovation and regulatory systems.

The results of the analysis indicate that digital technologies are destabilizing traditional patterns of knowledge production and distribution, blurring the boundaries between professional expertise and automatically generated information. In this context, universities are given a new institutional responsibility: they become intermediaries between technological innovation, social values, and public policies. It is through the activities of the third mission – knowledge transfer, cooperation with industry, participation in public policy-making, and civic engagement – that academic institutions can concretely contribute to the implementation of environmental, social, and governance standards that the ESG framework seeks to institutionalize.

The paper, therefore, provided a clear answer to the main research question: Can the third mission of universities be seen as a mechanism for ESG compliance in the digital society? The research results show that the answer is affirmative. The third mission is not only a supplementary activity of the university, but a key institutional channel through which ESG normative goals are translated into concrete social and technological practices.

A special dimension of this process refers to the development of intellectual and ethical competencies necessary for responsible technology management. Critical thinking, the ability to understand complex technological systems, and empathy for the social consequences of innovation are becoming key competencies that universities pass on to students and the wider community. In this way, academic institutions contribute to the creation of social conditions in which technological progress can be aligned with democratic values and the principles of sustainable development.

The analysis conducted in this paper shows that the institutional relevance of universities in the digital age is increasingly defined by their ability to connect scientific knowledge, technological innovation, and social responsibility. It is precisely through the third mission that this relationship is concretized, as universities thereby act not only as observers of digital transformation, but also as its active normative actors. In this sense, the future of ESG management in the digital society is difficult to imagine without its active and institutionally empowered role.

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References

- Belkhir, L., & Elmeligi, A. (2018). Assessing ICT global emissions footprint: Trends to 2040 & recommendations. *Journal of Cleaner Production*, *177*, 448–463. doi:10.1016/j.jclepro.2017.12.239
- Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (FAccT '21)*, 610–623. doi:10.1145/3442188.344592
- Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity Press.
- Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and freedom*. Yale University Press.
- Benneworth, P. (2013). University engagement with socially excluded communities: Towards the idea of “the engaged university”. In P. Benneworth (Ed.), *University engagement with socially excluded communities* (pp. 3–31). Springer. doi:10.1007/978-94-007-4875-0_1
- Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, *26*, 1315–1344. doi:10.1093/rof/rfac033
- Brooks, C., & Oikonomou, I. (2018). The effects of environmental, social, and governance disclosures and performance on firm value: A review of the literature in accounting and finance. *The British Accounting Review*, *50*(1), 1–15. doi:10.1016/j.bar.2017.11.005
- Carayannis, E. G., & Campbell, D. F. J. (2009). ‘Mode 3’ and ‘Quadruple Helix’: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, *46*(3–4), 201–234. doi:10.1504/IJTM.2009.023374
- Carayannis, E. G., & Campbell, D. F. J. (2012). *Mode 3 knowledge production in quadruple helix innovation systems: 21st-Century democracy, innovation, and entrepreneurship for development*. Springer.
- Castells, M. (2010). *The Rise of the Network Society* (2nd ed.). Wiley-Blackwell.
- Clark, B. R. (1998). *Creating entrepreneurial universities: Organizational pathways of transformation*. Pergamon Press.
- Compagnucci, L., & Spigarelli, F. (2020). The third mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, *161*, 120284. doi:10.1016/j.techfore.2020.120284
- Crawford, K. (2021). *Atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press.



- Davies, M. (2015). A model of critical thinking in higher education. In M. Davies & R. Barnett (Eds.), *The Palgrave Handbook of Critical Thinking in Higher Education* (pp. 41–92). Palgrave Macmillan.
- Eccles, R. G., & Klimenko, S. (2019). The investor revolution. *Harvard Business Review*, 97(3), 106–116.
- Etzkowitz, H. (2003). Research groups as ‘quasi-firms’: The invention of the entrepreneurial university. *Research Policy*, 32(1), 109–121. doi:10.1016/S0048-7333(02)00009-4
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from national systems and “mode 2” to a triple helix of university–industry–government relations. *Research Policy*, 29(2), 109–123. doi:10.1016/S0048-7333(99)00055-4
- Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin’s Press.
- Fagbemi, B. T., Saah, B. P., Nduka, A. I., & Aloke, E. M. (2025). The evolution of ESG and sustainability reporting: A review of standards, challenges, and impacts on corporate transparency. *Journal of Economics, Business, and Commerce*, 2(2), 288–296. doi:10.69739/jebc.v2i2.1239
- Filho, L., Manolas, E., & Pace, P. (2018). The future we want: Key issues on sustainable development in higher education after RIO and the UN decade of education for sustainable development. *International Journal of Sustainability in Higher Education*, 16(1), 112–129. doi:10.1108/IJSHE-03-2014-0036
- Floridi, L. (2014). *The 4th Revolution: How the Infosphere Is Reshaping Human Reality*. Oxford University Press.
- Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R., Pagallo, U., Rossi, F., et al. (2018). AI4People—an ethical framework for a good AI society: opportunities, risks, principles, and recommendations. *Minds and Machines*, 28(4), 689–707. doi:10.1007/s11023-018-9482-5
- Gelles, D. (2023). How environmentally conscious investing became a target of conservatives. *The New York Times*. <https://www.nytimes.com/2023/02/28/climate/esg-climate-backlash.html>
- Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, 101889. doi:10.1016/j.jcorpfin.2021.101889
- Goddard, J., & Kempton, L. (2016). *The civic university: Universities in leadership and management of place*. CURDS, Newcastle University. doi:10.1787/hemp-v19-art20-en
- Gulbrandsen, M., & Slipersæter, S. (2007). The third mission and the entrepreneurial university model. In A. Bonaccorsi & C. Daraio (Eds.), *Universities and strategic knowledge creation: Specialization and performance in Europe* (pp. 112–143). Edward Elgar Publishing.
- Halpern, D. F. (2014). *Thought and knowledge: An introduction to critical thinking* (5th ed.). Psychology Press.
- Howaldt, J., Kaletka, C., & Schröder, A. (2018). Social innovation: Towards a new innovation paradigm. *RAM. Revista de Administração Mackenzie*, 19(6), 1–20. doi:10.1590/1678-6971/eRAMD180078
- Jasanoff, S., & Kim, S.-H. (Eds.). (2015). *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. University of Chicago Press.
- Jones, N. (2018). How to stop data centres from gobbling up the world’s electricity. *Nature*, 561(7722), 163–166. <https://www.nature.com/articles/d41586-018-06610-y>
- Kitchin, R. (2017). Thinking critically about and researching algorithms. *Information, Communication & Society*, 20(1), 14–29. doi:10.1080/1369118X.2016.1154087
- Knox, J. (2019). What does the “Postdigital” mean for education? Three critical perspectives on the digital. *Postdigital Science and Education*, 1(2), 357–370. doi:10.1007/s42438-019-00045-y
- Lundvall, B.-Å. (Ed.). (2010). *National systems of innovation: Toward a theory of innovation and interactive learning*. Anthem Press.
- Marginson, S. (2016). The worldwide trend to high participation higher education. *Higher Education*, 72(4), 413–434. doi:10.1007/s10734-016-0016-x
- Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A Revolution that will transform how we live, work, and think*. Houghton Mifflin Harcourt.
- Merton, R. K. (1973). *The sociology of science: Theoretical and empirical investigations*. University of Chicago Press.
- O’Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Crown Publishing Group.



- Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Harvard University Press.
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., et al. (2013). Academic engagement and commercialisation. *Research Policy*, 42(2), 423–442. doi:10.1016/j.respol.2012.09.007
- Pinheiro, R., Benneworth, P., & Jones, G. A. (2012). Universities and regional development. *European Journal of Education*, 47(1), 66–78. doi:10.1111/j.1465-3435.2011.01515.x
- Powell, W. W., & Snellman, K. (2004). The knowledge economy. *Annual Review of Sociology*, 30, 199–220. doi:10.1146/annurev.soc.29.010202.100037
- Ranga, M., & Etzkowitz, H. (2013). Triple helix systems. *Industry and Higher Education*, 27(4), 237–262. doi:10.5367/ihe.2013.016
- Schoenmaker, D., & Schramade, W. (2019). *Principles of sustainable finance*. Oxford University Press.
- Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury Academic.
- Shapin, S. (2008). *The scientific life: a moral history of a late modern vocation*. University of Chicago Press.
- Srnicek, N. (2017). *Platform Capitalism*. Polity Press.
- University of London. (2023). *Guidance on the use of artificial intelligence in teaching and assessment*. <https://www.london.ac.uk/about-us/governance/policies/artificial-intelligence-policy>
- University of Pittsburgh. (2022). *Environmental, Social, and Governance Report*. <https://www.financeoperations.pitt.edu/esg-report>
- Van Dijck, J., Poell, T., & De Waal, M. (2018). *The platform society: Public values in a connective world*. Oxford University Press.
- Wals, A., & Benavot, A. (2017). Can we meet the sustainability challenges? *European Journal of Education*, 52(4), 404–413. doi:10.1111/ejed.12250
- Watson, D., Hollister, R., Stroud, S., & Babcock, E. (2011). *The engaged university: International perspectives on civic engagement*. Routledge.
- Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. PublicAffairs.

