

The university as an intellectual capital catalyst for sustainable organisations: conceptualising the nexus

International
Journal of
Organizational
Analysis

Carla Del Gesso and Paola Parravicini

*Department of Private Law and Legal History, University of Milan,
Milan, Italy, and*

Renato Ruffini

Department of Law “Cesare Beccaria”, University of Milan, Milan, Italy

Received 5 April 2024
Revised 21 August 2024
Accepted 22 August 2024

Abstract

Purpose – Intellectual capital (IC) is an increasingly important strategic asset for sustainable value creation in organisations. This paper aims to provide a conceptual perspective on the university’s role as a catalyst for IC creation and development within the dynamic landscape of organisations, exploring the nexus to capture its essence.

Design/methodology/approach – Adopting a conceptual framework development approach, key concepts were cohesively and coherently synthesised from various theoretical underpinnings, namely, the multiple capitals approach to maximising corporate value creation, the evolved triple bottom line approach to corporate sustainability, the triple helix innovation model and its subsequent extensions, the upper echelons theory and the social licence construct linked to stakeholder, legitimacy and institutional theories.

Findings – A comprehensive conceptual framework was developed that outlines universities’ role in catalysing four corporate IC forms crucial to sustainable organisational value creation: human capital, governance capital, social/relational capital and structural/organisational capital. The framework interprets this role of universities as dynamic IC reservoirs serving regional ecosystems for sustainable development. It highlights the synergistic sustainable value creation between universities and organisations in host communities and broader society, with university governance acting as a key driver.

Originality/value – This paper offers a theoretically grounded interpretation of universities’ pivotal role in catalysing essential forms of IC to support contemporary organisations’ sustainable value-creation processes. The proposed framework has the potential to ignite conversations on the crucial connection between universities and corporate IC development relevant to sustainable organisations, inspiring future empirical research, reflection and discussion.

Keywords Universities, Corporate intellectual capital, Sustainable value creation, Sustainable development, Corporate sustainability, Multiple capitals approach

Paper type Conceptual paper

1. Introduction

Any organisation in any sector is designed to create long-term value that benefits itself and its stakeholders, aligning with corporate sustainability goals (Freudenreich *et al.*, 2020). Operating as an *open system* within its ecosystem, an organisation’s business model involves



Funding: This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Declaration of competing interest statement: On behalf of all authors, the corresponding author states that there is no conflict of interest

dynamic interactions that pose risks and opportunities for executives to manage to ensure survival and sustainable success. Creating sustainable value over time is a complex process that engages organisations in multiple forms of value sources and outcomes, beyond just financial and physical capital (Manninen *et al.*, 2024). Intangible resources, commonly acknowledged under the intellectual capital (IC) umbrella, are crucial for innovation and increasingly essential for corporate survival and sustainability (Franco *et al.*, 2023; Hama and Cavusoglu, 2023).

Introduced by Kenneth Galbraith in 1969 as the “using of knowledge and skills” in an organisation’s value-creation process, the IC concept has been debated since the dawn of the knowledge society (Stewart, 1997; Swart, 2006, p. 137). Over the past decade, IC studies have significantly increased, fuelling an interdisciplinary debate steered towards strategic knowledge resource management to address large-scale issues such as the sustainable development goals (SDGs) outlined in the United Nations 2030 agenda (Alvino *et al.*, 2021). This trend is also reflected in emerging green IC studies that integrate environmental sustainability concerns (Malik *et al.*, 2020). The term IC commonly encompasses various forms of knowledge-based capital, traditionally categorised into three sub-components: human, structural and relational capital (Bontis, 1999; Dumay, 2016) – or four, if social capital is considered as a separate dimension (Ferenhof *et al.*, 2015). The conventional tripartite IC categorisation emphasises knowledge resources embedded in people (human capital), within the organisation and its systems (structural capital) and in relationships with customers and other stakeholders (relational capital) (Dumay and Garanina, 2013; Gupta *et al.*, 2016). Specifically, *human capital* consists of intangible values owned by the individual human resources of an organisation, including knowledge, skills, education, experience, creativity, attitudes, innovation capability, motivation, health and well-being. These values of people are recognised as precious resources for enhancing an organisation’s overall performance and value creation, as well as the effectiveness of other capitals. They serve as indispensable assets in pathways towards achieving organisational sustainability, while driving resilience and adaptability to evolving environmental and social landscapes (e.g. Cheikh and Noubbigh, 2019; Malik *et al.*, 2020). *Structural capital*, also referred to as *organisational capital*, consists of intangible values owned by an organisation and stored in business processes and structures, including tacit routines, explicit procedures and rules, strategies, systems, databases, culture and intellectual property (Swart, 2006). Complementing and empowering human capital, these organisational values are essential in pursuing sustainable performance and value creation, such as through a pro-environmental organisational culture and green innovations in processes, products, technologies and managerial systems (Malik *et al.*, 2020; Astuti *et al.*, 2023). *Relational capital*, in its broader meaning of *social capital*, consists of intangible values inherent in and generated through an organisation’s intra- and extra-networks of relationships (Swart, 2006; Coulson *et al.*, 2015; Ferenhof *et al.*, 2015). Social/relational capital enables knowledge and information sharing between organisations and their stakeholders, such as customers, suppliers, partners and other interested parties, thereby supporting and benefiting the sustainable organisational value-creation process (Astuti *et al.*, 2023).

Increasingly implicated in contemporary real-world issues, universities play a growing important role in promoting economic and social progress within their communities and realising the SDGs, aligning with their institutional missions (Gunasekara, 2004; Trencher *et al.*, 2014; Stein, 2024; Vien and Galik, 2024). This promotion of progress is inherent in the concept of a university, a global phenomenon understood as both an idea and an institution (Barnett, 2016). Indeed, the term “university” refers to significant social institutions that typically offer education, research, outreach and engagement with the economy and society. The university is generally understood as a complex umbrella encompassing different higher

education institutions that have emerged worldwide, including public and private universities, colleges, business schools, polytechnics and more, making it challenging to define (Alemu, 2018). Knowledge, the intangible product of a university, arguably stands as the most influential force in shaping the evolution of professions, social classes, regions and nations and transforming society towards sustainability (Alemu, 2018; Vien and Galik, 2024). Through education, research and their third mission – an evolving mission reflecting the contemporary university’s function in society – as well as by setting an example through their activities, universities can indeed support entrepreneurial development, foster innovation, promote responsible leadership, ensure effective corporate governance and contribute to sustainability in organisations within their regional ecosystems (Hogner and Kenworthy, 2010; Adams *et al.*, 2011; Trencher *et al.*, 2014; Dzimińska *et al.*, 2020; Guerrero *et al.*, 2023).

A thriving academic debate is emerging in the business management literature, addressing a new supportive role of universities in meeting global sustainability challenges. This debate increasingly positions universities at the forefront of sustainable development and transformation in their surrounding territories. As paramount drivers of knowledge production and dissemination, as well as facilitators for society’s sustainability and innovation transitions, they are crucial players in achieving the SDGs (e.g. Klofsten *et al.*, 2019; Leal Filho *et al.*, 2019; Ramísio *et al.*, 2019; Salamzadeh *et al.*, 2022; Guerrero *et al.*, 2023; Stein, 2024). Accordingly, universities are facing managerial challenges associated with their capacity to leverage activities to yield social, innovative and economic outcomes in today’s changing times (Cruz-Amarán *et al.*, 2020). Universities’ commitment to creating societal value involves fostering strategic organisational capabilities, including human and social capital (Klofsten *et al.*, 2019). Thus, universities, especially business schools, can actively contribute to shaping and enhancing organisations’ IC forms necessary for sustainable corporate value creation over time.

To contribute to this ongoing debate, this paper posits that universities act as catalysts in this process, actively facilitating the formation and development of IC within organisations. This theme has not yet been closely discussed in the literature, highlighting a gap this work seeks to address to spark future discourse. Specifically, this paper aims to provide a conceptual perspective on the university’s role as a catalyst for IC creation and development within the dynamic landscape of organisations, exploring the nexus to capture its essence. Building on existing literature, the study establishes a foundation for conceptualising this role by drawing upon and cohesively integrating related concepts from:

- the multiple capitals approach to maximising corporate value creation, which underpins the significance of corporate IC forms for organisations’ ability to create value over time;
- the evolved triple bottom line (TBL) approach to corporate sustainability, which underpins the importance of rethinking organisations’ sustainable value-creation processes more holistically across multiple sustainability performance dimensions;
- the triple helix innovation model and its subsequent extensions, which underpin the significance of universities as key innovation players in sustainable organisational ecosystems;
- the upper echelons theory, which underpins the significance of university governance and organisational leadership in the investigated nexus; and
- the social licence construct linked to stakeholder, legitimacy and institutional theories, which underpins the importance of universities and other organisations operating in alignment with social acceptance.

Key insights from these theories were synthesised to support a proposed framework elucidating the nuanced interplay between universities and corporate IC shaping.

This paper offers a theoretically grounded interpretation of universities' pivotal role in catalysing essential forms of IC to support organisations' sustainable value-creation processes – human capital, governance capital, social/relational capital and structural/organisational capital. It synthesises this role within a comprehensive framework that captures this conceptual relationship, for which, to the authors' knowledge, no existing literature provides a focused and thorough treatment. The framework potentially benefits universities' policies, strategic decision-making and practices to bolster their role in contemporary society and sustainable development by informing the dynamic promotion of essential IC forms for sustainable value creation within organisations in their territories. This, in turn, helps organisations navigate the complexities of today's corporate environment, including the challenges of rapid technological and digital advancements, and mounting sustainability pressures and regulations for urgently tackling environmental and social crises. By leveraging their intellectual assets, organisations can ensure long-term sustainable value for themselves and their stakeholders. Indeed, organisations' engagement with rising global concerns and their commitment to achieving the SDGs require sustainability-oriented competencies, digital and governance capabilities and new awareness and knowledge, which can be sourced and developed in universities to implement socially responsible corporate behaviours and innovative solutions. Therefore, this study is timely and relevant, and its value lies in its potential to ignite conversations on the crucial connection between universities and corporate IC development relevant to sustainable organisations, inspiring future empirical research, reflection and discussion. The arguments presented could serve as a theoretical basis for future studies in this field. Furthermore, from a practical and policy perspective, this study has the potential to raise awareness and provide actionable insights for university governance leaders as well as executives within organisations.

After this introduction, the paper proceeds as follows. Section 2 provides an overview of existing research on the relationship between universities and the IC of sustainable organisations. Section 3 outlines the conceptual framework development approach used in this study, presenting the theoretical perspectives considered for review. Section 4 reviews key theoretical concepts that form the foundation of the framework proposed in Section 5. The paper concludes in Section 6, outlining the study's contributions and implications with prospective research directions.

2. The university and the sustainable organisations' IC: literature background overview

Recent literature has explored various university models promoting sustainability for attaining the SDGs, responding to rising calls for universities to reconsider their societal roles in sustainable development transformations (Cuesta-Claros *et al.*, 2022). For instance, Dzimińska *et al.* (2020) proposed a model where universities act as culture change agents through teaching, research and societal services, while also serving as inspiring examples of sustainable practices for stakeholders. Using case studies, Purcell *et al.* (2019) illustrated how universities can drive societal transformation and catalyse local community innovation by leveraging sustainability strategies to achieve the SDGs, with an emphasis on leadership and partnerships. An expanding body of literature on university sustainability and the SDGs has emerged recently (Dave *et al.*, 2014; Paletta and Bonoli, 2019). The university is seen as a vehicle for advancing ideals and broad visions, with sustainability opening up possibilities for realising its potential (Barnett, 2016).

In exploring the relationship between IC and universities, [Todericiu and Șerban \(2015\)](#) argued that human capital, structural capital and relational capital form a competitive advantage that distinguishes organisational performance. Similarly, [Salinas-Ávila et al. \(2020\)](#) examined the interconnections between IC dimensions at universities and knowledge generation, indicating this as an emerging area of research. In their study on the significance of the university education system in creating IC within national economies, [Jakubowska and Rosa \(2014\)](#) noted that higher education influences human capital, which in turn helps to develop structural and relational capital, contributing to organisational value creation. [Trequattrini et al. \(2018\)](#) and [Salamzadeh et al. \(2022\)](#) also highlighted the role of entrepreneurial universities in enhancing local IC and social capital, respectively. However, none of these studies focuses on universities' role in catalysing corporate IC forms for sustainable value creation in organisations.

Prior studies on university contributions to IC formation within organisations have primarily focused on human capital. For instance, [Gunasekara \(2004\)](#) explored the roles of three Australian universities in shaping human capital renewal in regional economies, highlighting their key role through education programs aligned with regional knowledge needs. Similarly, [Abel and Deitz \(2012\)](#) suggested that colleges and universities can enhance local human capital by expanding the supply of skills and stimulating their demand, while [O'Neill and Bagchi-Sen \(2023\)](#) emphasised the importance of public universities in attracting, training and retaining skilled labour locally. Since the adoption of the United Nations 2030 agenda and its 17 SDGs – by world leaders in September 2015 as the global roadmap for sustainable development—literature has increasingly focused on universities' contributions to sustainable development through education programs ([Leal Filho et al., 2019](#)). The latter authors also advocated that embedding SDGs in curricula may promote mindful future human capital and sustainable living. University education plays a crucial role in human capital growth by imparting skills, fostering intellectual development and enhancing critical thinking – an essential quality for improving resource use and human conditions ([Alemu, 2018](#)).

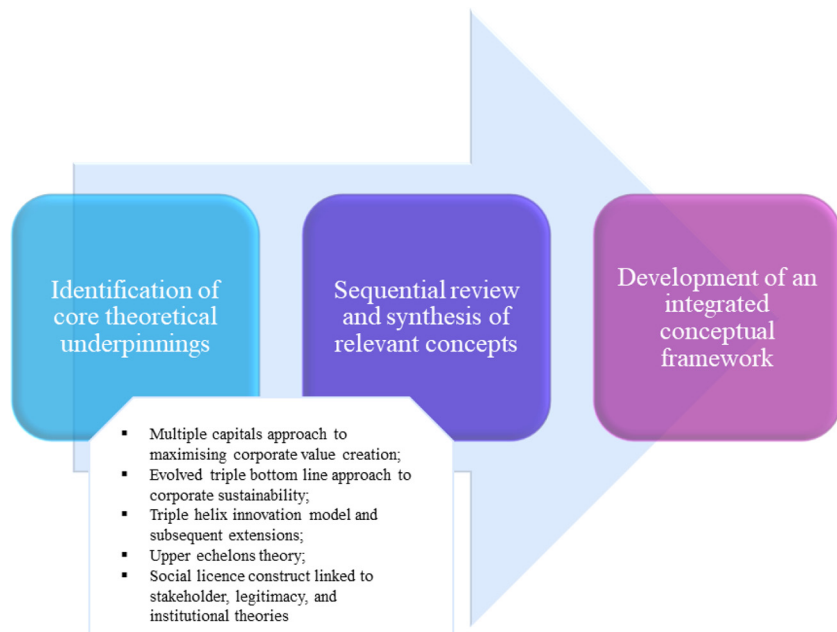
This literature overview highlights a research gap in understanding the nexus between universities and the broader spectrum of IC within sustainable organisations. Existing studies have largely neglected IC forms beyond human capital, such as governance, social/relational and structural/organisational capital. This study aims to fill this gap by developing a comprehensive framework that outlines universities' role in catalysing various IC forms essential for sustainable organisational value creation.

3. Conceptual framework development approach

To conceptualise the role of universities in catalysing corporate IC forms, this study adopts a conceptual framework development approach, which involves inductively synthesising concepts from various theoretical perspectives to develop a new conceptual framework ([Imenda, 2014](#)).

As illustrated in [Figure 1](#), the framework development began by identifying core theoretical underpinnings that provide the foundations for establishing a nexus between universities and the development of organisations' IC for sustainable value creation. The theoretical selection was guided by the relevance and applicability of each theory to this context. Relevant concepts were then sequentially reviewed and integrated to build a robust conceptual framework.

As shown in the flowchart in [Figure 2](#), the multiple capitals approach was discussed first, as it supports the relevance of IC forms to organisations' sustainable value-creation processes. Extending the traditional people-planet-profit paradigm, the evolved TBL



Source: Authors' own work

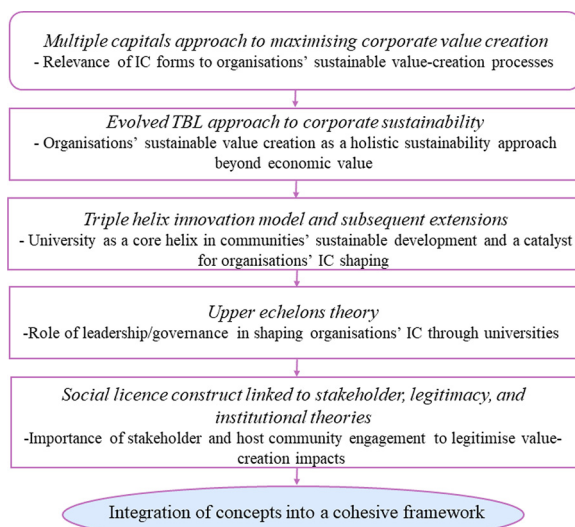
Figure 1. Conceptual framework development steps

approach followed logically, broadening the discussion on corporate value creation by incorporating multifaceted sustainability pillars. Next, the triple helix innovation model and its subsequent extensions were considered. Indeed, this model recognises the university's role in driving communities' sustainable development and societal progress, thereby supporting its catalytic role in corporate IC shaping. The upper echelons theory was then included, suggesting that personal characteristics and experiences of executives influence organisational decisions. This theory underpins leadership, particularly university governance leaders, as a key element driving corporate IC development. Finally, the construct of social licence to operate was discussed to further strengthen the theoretical foundations by incorporating social acceptance and legitimacy as crucial factors for the functioning of universities and other organisations. Stakeholder, legitimacy and institutional theories were also included to emphasise the importance of engaging with stakeholders and communities to secure approval for value-creation impacts.

4. Theoretical underpinnings: review of concepts

4.1 The multiple capitals approach to sustainable value creation

The multiple capitals model, introduced in the early 2000s as a sustainability framework, became associated with the concept of business model value creation by the Integrated Reporting (IR) Framework issued by the International Integrated Reporting Council (IIRC) in 2013 and subsequently revised in 2021 (Doni *et al.*, 2019). This IR framework is part of an evolving corporate reporting system that covers both financial and non-financial sustainability disclosures in a single report. It describes value creation as a portfolio of value,

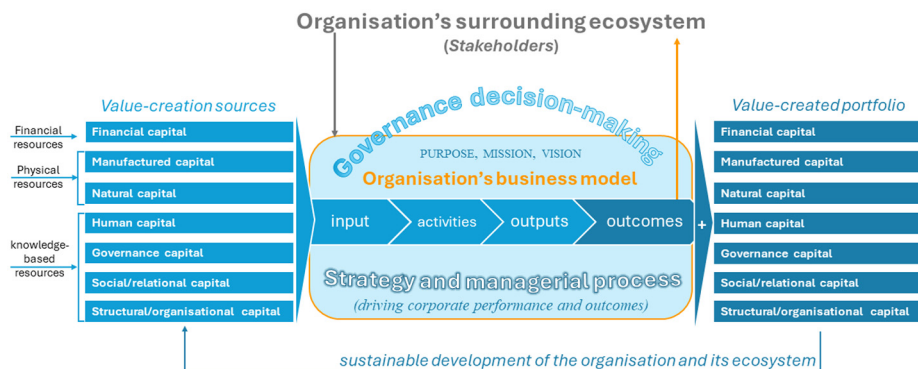


Source: Authors' own work

Figure 2. Flow chart showing the core contribution from the theoretical underpinnings used to develop the conceptual framework

integrating six forms of capital: financial, manufactured, natural, human, social and relationship and intellectual (IIRC, 2021). According to the IR framework, an organisation's "value is not created, preserved or eroded by or within an organization alone" but it is influenced by (and in turn influences) its external environment and depends on resources and stakeholder relationships (i.e. the 'capitals') used and affected by the organisation (IIRC, 2021, p. 15). The six capitals, upon which an organisation's competitive edge and long-term sustainable value depend (Adams, 2017), are stocks of value that can be increased or depleted through an organisation's business activity, performance and outcomes. Specifically, they are inputs into a business model transformed into outputs through business activities, leading to positive or negative outcomes that increase or decrease the capitals themselves (Coulson *et al.*, 2015; IIRC, 2021). Corporate value, therefore, results from co-creation through a synergistic value-creation process with and for stakeholders. This approach advocates for shared value as a strategic and innovative way to simultaneously address business challenges and socio-economic progress (Freudenreich *et al.*, 2020; Lüdeke-Freund *et al.*, 2020). With this perspective, the horizons of corporate strategy and the managerial process through which strategy attainment creates value expand to better influence both business growth and sustainable development of the surrounding ecosystem (Figure 3).

The IIRC's multiple capitals framework has rekindled interest in IC, introducing a holistic approach to maximising corporate value creation that emphasises the strategic relevance of non-financial and non-physical capital (Coulson *et al.*, 2015; Doni *et al.*, 2019). Indeed, three of the six IR capitals, namely, human capital, social and relationship capital and IC *stricto sensu* are intangible capitals similar to the three commonly accepted IC components, human capital, social/relational capital and structural/organisational capital, respectively



Source: Authors' adaptation from IIRC (2021, p. 22)

Figure 3. Relevance of IC forms to organisations' sustainable value-creation processes

(Adams *et al.*, 2013; Dumay, 2016). Specifically, according to the framework, IC (*stricto sensu*) includes intellectual property, such as patents, copyrights, software, rights and licences and organisational capital, such as tacit knowledge, systems, procedures and protocols (IIRC, 2021), which are intangibles that belong to an organisation and contribute to its functioning. Furthermore, in the description of human capital, the IR framework includes people's "ability to lead, manage and collaborate" (IIRC, 2021, p. 19). This suggests viewing human capital as the most important, given its responsibility for identifying, developing and implementing corporate strategies that lead to value creation, consequently enhancing the other capital forms. People's vision and mindset drive innovation and progress. As for social/relational capital, the IR framework labels it as social and relationship capital, which is defined as relationships within and between communities and stakeholder networks, and "the ability to share information to enhance individual and collective well-being" including norms, common values and behaviours (IIRC, 2021, p. 19). Therefore, at the core of social/relational capital is the ability to develop intra/extra-organisational networks of relationships (Coulson *et al.*, 2015), which are crucial for building an organisation's reputation, establishing its social legitimacy and fostering the development of inter-organisational cooperations. Finally, although not explicitly, the IR framework also identifies a further IC form in *governance capital* (Aras and Mutlu Yıldırım, 2022). The leadership structure, including the skills and diversity of those charged with governance, supports an organisation's ability to create value over time. Indeed, governance involves making strategic decisions, promoting and enabling innovation and establishing the organisation's culture, ethical values, risk management approaches, stakeholder relationships and the use of and effects on the capitals (IIRC, 2021, p. 40). Therefore, governance is a paramount factor that leads to improved organisational performance and increased IC accumulation (Van *et al.*, 2022).

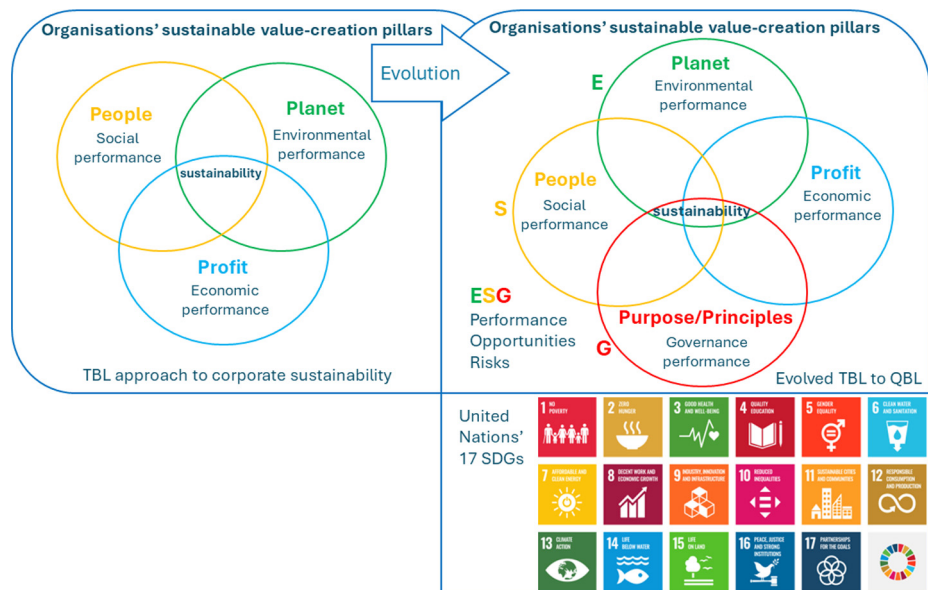
Multiple capitals can drive organisations towards both financial stability and more engagement in sustainable development actions and impacts (Adams *et al.*, 2013). The relevant aspect to grasp in this approach is indeed the conception of value as a holistic portfolio that integrates IC forms, which provides a wider and deeper understanding of corporate performance and outcomes and the impact these cause on the development of territories and local communities (Figure 3). IC forms – such as the human resource skillset,

mindset, knowledge, experiences, intelligence and relationships or the organisation's social and relational networks, processes, reputation, brands, modes of communication, innovation capability, information systems and so forth – are becoming increasingly relevant to the improvement of business performance for survival and success, whether operating in normal or crisis conditions. Generally speaking, in a knowledge-based economy era, IC forms are value-creation sources as important as if not more important than financial capital and other tangible assets (Cheikh and Noubbigh, 2019). Contemporary research also provided evidence of the worthiness of IC accumulation, especially in contexts of emerging market economies (e.g. Van *et al.*, 2022). Beyond financial and physical capital, IC forms are therefore essential for today's corporate world to cope with current and potential ecosystem challenges. In the context of a knowledge-based economy and society, these IC forms are increasingly pivotal in enhancing both business value creation and regional economic growth (Bismuth and Tojo, 2008; Cheikh and Noubbigh, 2019; Dane-Nielsen and Nielsen, 2019).

4.2 *The evolved TBL approach to holistic sustainability and corporate responsibility*

Pioneered in 1994 by John Elkington as a corporate sustainability approach, the TBL concept has become popular, especially in the accounting field, for managing, measuring and reporting sustainability as a triple goal – people, planet and profit (Milne and Gray, 2013). It established three sustainability pillars to capture organisations' sustainable value creation for responsible development, accounting for social and natural capital values beyond financial valuations (Bradley, 2024). This approach recognises that a thriving economic bottom line (profit) intertwines with bottom lines for social (people) and environmental performance (planet) that influence long-term corporate strategies, operations and decision-making (Budsaratragoon and Jitmaneeroj, 2019). The social sustainability pillar addresses social impacts on stakeholders and communities, including ethical employment practices, human rights and policies on equity, diversity and inclusion. The environmental sustainability pillar focuses on reducing negative environmental impacts, such as lowering carbon footprints, minimising waste and implementing eco-friendly initiatives to address natural resource conservation, climate change and biodiversity crises. Thus, the TBL concept has become central to sustainability theory, remaining relevant in corporate social responsibility (CSR) discourses by emphasising organisations' engagement with socially and environmentally responsible behaviours balanced with economic goals to achieve sustainable development (Milne and Gray, 2013).

As outlined in Figure 4, more recently, the TBL concept has evolved towards a more holistic approach to corporate sustainability, supported by the release of the United Nations' 17 SDGs in 2015 (Tajbakhsh *et al.*, 2024). These shared global goals set comprehensive targets addressing a wide range of sustainable development issues for people-planet prosperity, from poverty and inequality to climate change, environmental protection, peace and justice, engaging public and private organisations, governments and civil society. Elkington himself recently rethought the TBL concept, concluding that it can serve as a foundation for a radical and comprehensive sustainability approach (Elkington, 2018). In this context, scholars are shaping a quadruple bottom line (QBL) framework that extends the TBL paradigm by incorporating a fourth "P". This dimension is variously articulated with terms such as "purpose" – the cultural or spiritual component – and/or "principles", "policy" and "progress" (e.g. Bradley, 2024; Tajbakhsh *et al.*, 2024). Particularly, the fourth "P" is often identified as "purpose", embodying the culture and corporate governance ethics that guide an organisation's actions to balance social, environmental and economic objectives – namely, people, planet and profit (Panneels, 2023). Thus, some QBL scholars also propose "governance" as the fourth sustainability pillar (Budsaratragoon and Jitmaneeroj, 2019),



Source: Authors' own work

Figure 4. Organisations' holistic sustainable value creation

arguably reflecting the relevance of corporate leadership to driving ethical principles in corporate operations towards sustainable value creation. This perspective aligns with the increasing focus on environmental, social and governance (ESG) performance, which investors and stakeholders are increasingly considering, beyond financial performance, when assessing companies' sustainability, reputation and risks (Budsaratragoon and Jitmaneeeroj, 2019). Indeed, ESG opportunities and risks have assumed unprecedented relevance in contemporary value-creation processes (Adams, 2017). Adding the governance dimension is crucial for developing corporate strategies that drive institutional change towards sustainability, with universities uniquely positioned and obliged to lead and promote this transition as knowledge producers and innovation hubs (Dave et al., 2014).

4.3 The triple helix innovation model and subsequent extensions

Framed in the knowledge-based economy and society discourses, the triple helix model identifies, within university-industry-government interaction and cooperation, the motive power of innovation dynamics that fosters sustainable performance and growth of wider business ecosystems such as countries or communities (Etzkowitz and Leydesdorff, 2000; Cai and Etzkowitz, 2020). Specifically, this model posits the synergistic cooperation of the three institutional spheres (or helices) of university, industry and government, promoting entrepreneurship and innovation and fostering socio-economic development, especially at regional and local levels (Cai and Etzkowitz, 2020; Cai and Amaral, 2021). The triple helix model portrays the university as the fundamental helix and catalyst of change, generating and disseminating knowledge and innovation in its surrounding environment.

The development of the university's entrepreneurial activity – referred to as the “entrepreneurial university” – is a global phenomenon. This has led to the expansion of the university's third mission, an evolving mission shaping a broader role in society and progressively transforming its traditional “ivory tower” image (Audretsch, 2014; Etzkowitz, 2017; Cai and Amaral, 2021). The university's third mission – with teaching and research historically designated as the first and second missions, respectively – is indeed described as the contribution of universities to the economic, social and cultural growth of the territories they serve (Jaeger and Kopper, 2014). The third mission thus encompasses manifold complementary activities that a university performs in society. This reflects an evolving role extending beyond traditional academia, including social and community engagement, the capitalisation of knowledge, patents, technology licensing, start-up firms, outreach to local communities, continuous training programs, expert consultancy services and active participation in policy shaping. Recently, some authors have even used the term “fourth mission” to emphasise the emerging sustainability focus – thus beyond conventional third mission commercial activities (e.g. Morawska-Jancelewicz, 2022). In other words, this term underscores the university's social engagement with stakeholders to promote sustainable development through research and teaching that benefits the well-being of host communities and their social innovation.

The triple helix and the third mission are interdependent and aligned concepts (Zawdie, 2010; Fijałkowska and Hadro, 2018). Both identify the driving role that the university should play in innovation and development processes through knowledge-based influences and interactions. The triple helix model supports the role of the university's third mission. This mission is increasingly important for regional economic and societal growth and sustainable development in today's knowledge and innovation-based era (Marques *et al.*, 2006; Jaeger and Kopper, 2014; Salamzadeh *et al.*, 2022). As argued by Trencher *et al.* (2014), universities assume a new co-creation function for sustainability that goes beyond conventional technology transfer, by actively engaging in collaboratively shaping societal changes to achieve sustainable development in specific regions, cities or places. Universities' partnerships and collaborations with businesses, government and civil society are important premises for tackling emerging sustainability challenges (Fijałkowska and Hadro, 2018).

Precisely due to the increasing importance of sustainable development in contemporary society, the triple helix model has also evolved since its inception, in parallel with the range of third mission activities. It has essentially incorporated social and environmental dimensions into knowledge production and innovation systems, emphasising a university's renewed role in driving institutional change by engaging with its communities (Morawska-Jancelewicz, 2022). Indeed, subsequent adjustments have been proposed in response to societal transformations produced by technological innovation, social responsibility and sustainability (Cai and Lattu, 2022). These include the quadruple helix model, which incorporates “civil society”, or the public/community, as the fourth helix, emphasising a sustainable development perspective that integrates innovation, entrepreneurship and democracy for social well-being; the quintuple helix model, which further adds “natural environments of the society” as a fifth helix to address the socio-ecological transition of society, thus integrating environmental sustainability challenges into economic and social development; as well as the civically engaged triple helix model, which addresses sustainable innovation as the interaction among the sustainable entrepreneurial university, the sustainable industry and the sustainable government within the civil society (Cai and Etzkowitz, 2020; Morawska-Jancelewicz, 2022). Sustainable innovation is understood as the innovation that improves overall sustainability performance dimensions, with the university

remaining a key agent in understanding the dynamics of innovation in a knowledge-based economy and changing society (Cai and Lattu, 2022).

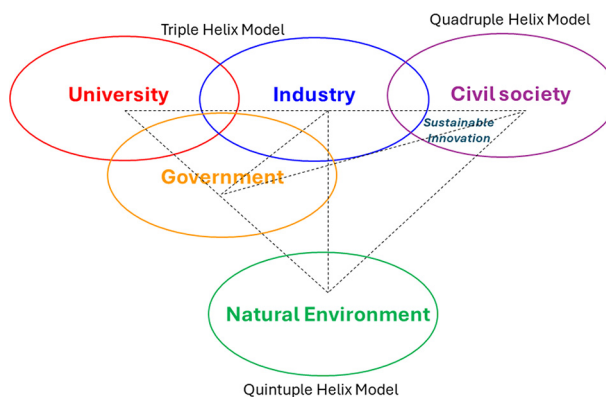
Accordingly, the triple helix framework with its subsequent extensions (Figure 5) supports conceptualising universities' catalytic role in corporate IC shaping while engaging in their core and intertwined activities of teaching, research and third mission in its broader scope. Moreover, an IC perspective is inherent in third mission activities as knowledge resources are both the inputs and outputs of the university business model (Secundo *et al.*, 2017). Ultimately, the university is the key institution responsible for generating and sharing the knowledge necessary for organisations to perform sustainably (Fijałkowska and Hadro, 2018; Marathe *et al.*, 2020).

4.4 Upper echelons theory

Hambrick and Mason's (1984) upper echelons theory posits that the strategic choices made by an organisation's top managers are influenced by their personal characteristics, experiences, values and cognitive frameworks, shaping organisational decisions and outcomes. From the perspective of this theoretical approach to strategic management, leadership behaviours are increasingly recognised as pivotal factors influencing the successful decision-making of organisations, with corporate governance being acknowledged as a multifaceted task (Abatecola and Cristofaro, 2020). Furthermore, when applied to the university context, this perspective suggests that leaders in university governance influence strategic resource management and the university's ability to perform excellently, thereby supporting sustainable growth (Hattke and Blaschke, 2015). These arguments underpin the idea that it is within the purview of university governance to work so that the surrounding ecosystem can advance economically, socially, ecologically, culturally and technologically. This involves fostering virtuous interactions with local organisations and communities, thereby effectively transitioning from the traditional condition of an ivory tower university to generating genuine social impact.

4.5 Social licence construct linked to stakeholder, legitimacy and institutional theories

The concept of social licence to operate originated in the mining industry as a metaphor for community approval, driven by the imperatives of sustainable development (Prno and



Source: Authors' own work

Figure 5. Triple helix framework with its subsequent extensions

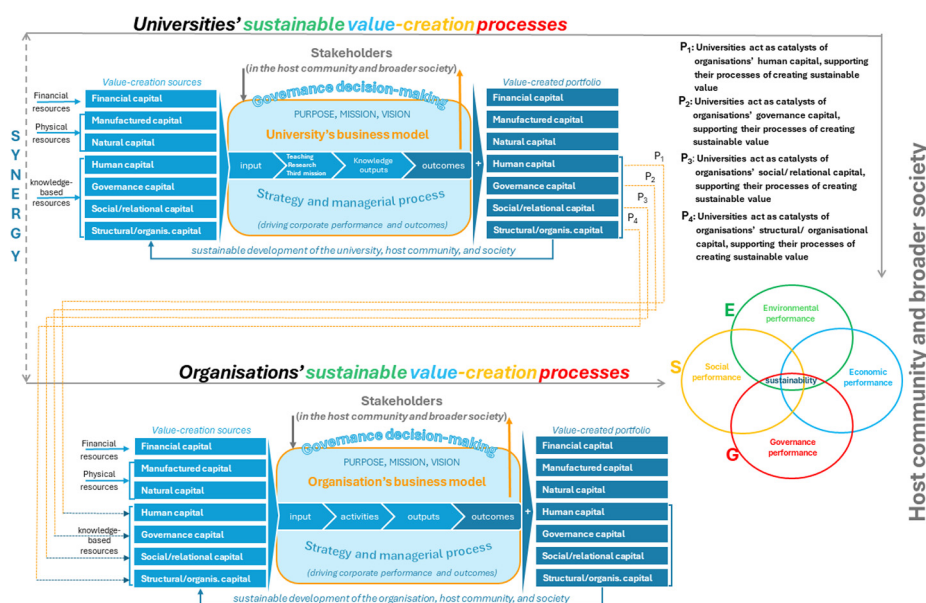
Slocombe, 2012). It represents an organisation's ongoing acceptance by its stakeholders, particularly by responding to the changing expectations and concerns of the local host community and broader civil society (Dare *et al.*, 2014; Parsons and Moffat, 2014; Chen *et al.*, 2021). This concept is intimately linked to stakeholder theory, which underscores the necessity for organisations to engage with and meet the interests of multiple stakeholders, with community engagement being critical to gaining and maintaining legitimacy, credibility and trust in undertaken activities (Dare *et al.*, 2014).

The social licence concept also intersects with CSR and social contract discourses within legitimacy theory, suggesting that organisations strive to align with societal norms and beliefs to be perceived as legitimate by the public (Parsons and Moffat, 2014). Additionally, it resonates with institutional theory, which posits that organisations conform to social institutions such as rules, norms and values to secure legitimacy and social acceptance; thus, governance, essential for achieving sustainability objectives, plays a pivotal role in shaping social licence processes (Prmo and Slocombe, 2012).

Consequently, universities, akin to any organisation, must consider their dynamic relationships with their host communities to maintain effectiveness and enhance social impact (Chen *et al.*, 2021). These theoretical underpinnings further bolster the proposed conceptual framework.

5. Proposed conceptualisation for the university's role as an IC catalyst for sustainable organisations

The conceptual framework in Figure 6 was developed by cohesively integrating the theoretical constructs reviewed. This framework articulates the role of universities in catalysing four forms



Source: Authors' own work

Figure 6. Proposed conceptual framework for the university's role as an IC catalyst for sustainable organisations

of corporate IC that support sustainable value-creation processes in organisations, demonstrating how they serve as “a pipeline of intellectual capital” (Todericiu and Șerban, 2015, p. 716). The framework interprets the sustainability link binding universities to their host communities and society, positioning them as reservoirs from which local organisations draw the IC needed for sustainable progress. Four propositions articulate this synergy of value creation, discussed in the subsequent subsections.

5.1 *University as a catalyst of organisations’ human capital*

Universities play a crucial role in developing *human capital* essential for regional, local and organisational innovation (Abel and Deitz, 2012; Salinas-Ávila *et al.*, 2020). They educate and train individuals, fostering technical skills and critical thinking necessary for organisations and communities. Universities also contribute to regional human capital by supporting skill renewal (Gunasekara, 2004) and acting as cultural and social change agents through teaching, scientific research and their third mission dedicated to sustainable development (Leal Filho *et al.*, 2019; Dzimińska *et al.*, 2020). Integrating sustainability topics in university courses is increasingly essential to prepare evolving workforces and future managers, executives, decision-makers and entrepreneurs to navigate complex, competitive and changing environments (Adams *et al.*, 2011; Collins, 2017; Marathe *et al.*, 2020). Especially business and management education needs redesigning to assist students in interpreting corporate sustainability in its comprehensive bottom lines, empowering current and future leaders to develop the skillset and mindset they can draw from to deal strategically with diverse sustainability business challenges (Bradley, 2024). This includes addressing emerging risks and opportunities, such as climate change, resource depletion, gender inequalities, unemployment and labour rights, corruption and other environmental, social and ethical issues, as well as technological and digital transformations. Universities have only recently started to rethink their curricula to instil sustainability-oriented competencies in students, adjust research programs to generate and disseminate new specific knowledge and, in general, transform their campus operations and partnerships (e.g. Paletta and Bonoli, 2019).

Assuming that universities, through their activities and exemplary practices, can meet the innovative skill needs for human capital development in their host communities and stimulate demand for these skills, the first proposition follows:

- P1. Universities act as catalysts of organisations’ human capital, supporting their processes of creating sustainable value.

5.2 *University as a catalyst of organisations’ governance capital*

Universities contribute to *governance capital* by fostering leadership capabilities grounded in sustainability awareness and values (Adams *et al.*, 2011; Collins, 2017). They can shape future leaders within organisations to be responsive, visionary and capable of driving corporate value creation and sustainable community development. Governance is crucial for addressing risks, seizing opportunities, adapting to change, setting and achieving strategic objectives, improving performance and efficiently planning and allocating multiple capitals – including natural capital – through creative and innovative solutions. As organisations, universities themselves can exemplify this by integrating sustainable development into their strategies and managerial and reporting processes (Paletta and Bonoli, 2019; Ramísio *et al.*, 2019; Dzimińska *et al.*, 2020), such as by implementing transformative strategies to create low-carbon campuses, which can inspire “green curricula” and catalyse more sustainable communities (Dave *et al.*, 2014). A growing body of literature highlights universities’ leading role in transitioning to a more sustainable

society through their activities, including education, research and community engagement as drivers of social innovation (e.g. [Purcell et al., 2019](#); [Morawska-Jancelewicz, 2022](#)). Addressing emerging ecosystem challenges increasingly demands organisations leverage governance capabilities, which intertwine with human capital as a crucial factor in improving regional growth ([Abdelbary and Benhin, 2019](#); [Sjödén et al., 2024](#)).

Assuming that universities, through their activities and exemplary practices, can meet the innovative capability needs for governance capital development in their host communities and stimulate demand for these capabilities, a second proposition is derived:

- P2. Universities act as catalysts of organisations' governance capital, supporting their processes of creating sustainable value.

5.3 *University as a catalyst of organisations' social/relational capital*

As a driving force for relationship building and a breeding ground for new businesses ([Marques et al., 2006](#)), universities act as facilitators of *social/relational capital* formation. They promote knowledge exchange networks ([Fijałkowska and Hadro, 2018](#)) and mobilise collaborations within and between communities, engaging with diverse stakeholders such as students, graduates, researchers, citizens, businesses, professionals, institutions, governments and political parties. Through widespread networks of relationships, universities facilitate meetings and dialogue with local organisations' players, enabling the sharing of new knowledge, problems, solutions and best practices. Their social engagement activities, including city cultural or musical events, science dissemination events and awareness-raising initiatives on social and environmental sustainability issues, can be a source of social and relationship capital. Fostering interactions with civil society can generate innovative benefits such as new competencies, ideas, relationships and partnerships. Moreover, universities' engagement with host communities through partnerships enables them to better respond to changes in local contexts and improve social impacts ([Chen et al. \(2021\)](#)). With an enhanced third mission role in society, universities are crucial players in developing social capital, a key organisational resource vital for regional socio-economic development ([Salamzadeh et al., 2022](#)).

Assuming that universities, through their activities and exemplary practices, can meet the innovative knowledge-sharing needs for social/relational capital development in their host communities and stimulate demand for this sharing, a third proposition arises:

- P3. Universities act as catalysts of organisations' social/relational capital, supporting their processes of creating sustainable value.

5.4 *University as a catalyst of organisations' structural/organisational capital*

Universities play a generative role in corporate *structural/organisational capital* through knowledge sharing based on both their traditional entrepreneurial activities (or technology transfer) and non-commercial sustainability-focused teaching and research ([Zawdie, 2010](#); [Morawska-Jancelewicz, 2022](#)). Technology transfer encompasses the application, exploitation and commercialisation of research outputs such as patents, technology licensing, spin-off firms, start-ups, incubators, science parks and intellectual property ([Audretsch, 2014](#)). These activities are sources of corporate product or process innovations linked to collaborative relationships between universities and industry, which also cover contracts for specific studies and commissioned consulting services ([Secundo et al., 2017](#)). University knowledge-sharing with their stakeholders also relies on non-commercial activities

integrating sustainable development concerns (e.g. [Leal Filho et al., 2019](#)), from which to draw the innovative structural/organisational competencies necessary for today's organisations. As a corollary, universities also contribute to forging innovation capital, process capital, technological capital and organisational capital. These capitals are increasingly recognised as pivotal in driving technological and sustainability transitions, serving as hubs for developing new technologies and knowledge that local organisations can harness to implement transformative changes ([Cruz-Amarán et al., 2020](#); [Vien and Galik, 2024](#)).

Assuming that universities, through their activities and exemplary practices, can meet the innovative competence needs for structural/organisational capital development in their host communities and stimulate demand for these competencies, a fourth proposition is derived:

- P4.* Universities act as catalysts of organisations' structural/organisational capital, supporting their processes of creating sustainable value.

6. Conclusion

This paper articulated a robust conceptual perspective on the catalytic role of universities in shaping corporate IC forms that organisations require to tackle current and potential ecosystem challenges, thereby fostering sustainable innovation and development in the served communities. These challenges include competitive pressures and the need for adaptation amid transitions to digital transformation and sustainability ([Sjödin et al., 2024](#)). Given their ascribed role in society and the pressure to address sustainable development, contemporary global challenges and technological progress have increased expectations on universities ([Dave et al., 2014](#); [Morawska-Jancelewicz, 2022](#)). Adopting a conceptual development approach integrating insights from various theoretical underpinnings, this study derived an original comprehensive framework ([Figure 6](#)). This framework outlines the role of universities in fostering four forms of corporate IC. It conceptualises how universities can catalyse sustainable organisations' human, governance, social/relational and structural/organisational capital, highlighting a value-creation synergy, with university governance acting as a key driver. This contributes to an understanding of the universities' pivotal role in shaping sustainable value creation in their host communities and broader society, acting as generators of innovative sustainability-oriented intellectual resources, promoters of technical and ethical human skills and governance capabilities, facilitators of fruitful relationships and contributors to organisational development, while also transforming themselves into sustainable campuses.

6.1 Study's contributions and implications

This study conceptualises the influential nexus between the sustainable value-creation processes of universities and organisations, introducing an IC focus that contributes to the existing literature in several ways. The theoretical implications extend beyond the specific domains of IC, organisational studies and higher education.

Firstly, the proposed conceptual framework contributes to a theoretical interdisciplinary discourse by integrating the multiple capitals approach, the evolved TBL approach, the extended triple helix innovation model, the upper echelons theory and the social licence construct linked to stakeholder, legitimacy and institutional theories, providing a robust foundation for future research. Secondly, the framework extends the understanding of IC's role in organisational sustainable value creation by adding governance capital as a significant form, aligning with the mounting call for improving ESG value impacts. Thirdly, this study

contributes to the ongoing blooming academic debate identifying university institutions as having a renewed paramount role in strategically driving sustainable development and innovation essential to achieve the SDGs (e.g. [Leal Filho et al., 2019](#); [Purcell et al., 2019](#); [Cruz-Amarán et al., 2020](#); [Dzimińska et al., 2020](#); [Cuesta-Claros et al., 2022](#); [Guerrero et al., 2023](#); [Stein, 2024](#); [Vien and Galik, 2024](#)). It adds universities' catalytic involvement in the dynamic process of corporate IC development necessary for creating sustainable value impacts within and for communities. Finally, this is the first study to focus on the nexus between universities and the IC development of sustainable organisations, filling a research gap.

This nexus is particularly topical given the unprecedented pressure to integrate sustainability into corporate strategy and value-creation processes, with universities called to lead necessary institutional changes. Universities reflect and shape their society and era ([Alemu, 2018](#)). Contemporary society demands sustainable organisations, as evidenced by increasing regulations promoting responsible corporate behaviour and ESG performance accountability, such as the European Corporate Sustainability Reporting Directive. Therefore, the proposed framework offers practical guidance for enhancing the symbiotic relationship between universities and organisations in pursuing sustainability goals. By raising awareness among university and organisational governance leaders, the framework supports a nuanced understanding of universities' pivotal role in shaping corporate IC. This understanding may guide informed decision-making and strategies to foster synergy between academia and local organisations, driving positive changes. It provides a foundation for university governance to craft policies that enhance their role as dynamic IC reservoirs within their regional ecosystems, thereby contributing to shared value creation for sustainable corporate value and a more responsible future. The framework also offers an opportunity for universities and other organisations to reflect on the transformative power of IC in the sustainable advancement of communities, places, regions and nations.

6.2 Prospective research directions

Despite its contributions, the primary limitation of this work lies in the theoretical nature of the proposed framework. Therefore, future research is needed to validate the conceptual claims made regarding IC and its dimensions. Regarding the first proposition (universities as catalysts of human capital), empirical studies could investigate how universities develop sustainability-oriented skills, knowledge and innovation capabilities among local organisational human resources through targeted activities and partnerships. Future research could explore integrating sustainability topics into degree programs (or green curricula) and research to enhance human capital within local businesses and organisations. Additionally, studies could examine how green curricula implementation impacts the development of green human capital and other forms of IC, including governance capital. Research efforts could also focus on how universities can improve their interactions with local communities to address evolving needs for specific new skills related to emerging technologies and green innovation. Finally, investigations could analyse how universities act as role models by enhancing human capital through their business model.

Regarding the second proposition (universities as catalysts of governance capital), in addition to research directions overlapping with human capital, researchers could assess the connection between universities and organisational governance capital through case studies. These could focus on initiatives promoting innovation in governance capabilities within the local business fabric and how such initiatives contribute to improved sustainability

performance. Further research could explore the influence of university governance models and leadership training programs on enhancing corporate governance practices within organisations. Studies could also delve into how the personal attributes of university leaders and governance structures influence efforts towards sustainable development, applying the upper echelons theory. Finally, investigations could analyse how universities act as exemplars by implementing ESG strategies that promote sustainable development within their communities.

Regarding the third proposition (universities as catalysts of social/relational capital), scholars could explore how universities' engagements through partnerships and networking with host communities contribute to social/relational capital development in organisations that support sustainable value creation. Investigations could look at university programs and activities that foster interactions with stakeholders. They could assess how effectively these activities generate innovative relationships, collaborations and social impacts, and explore stakeholder perceptions. Additionally, studies could focus on the role of universities in facilitating dialogue with local business players and other community members to share cutting-edge knowledge, best practices and solutions. Finally, future research could analyse the impact of university-led community engagement activities on developing social/relational capital and how these initiatives support sustainable regional socio-economic development.

Regarding the fourth proposition (universities as catalysts of structural/organisational capital), case studies and longitudinal research could provide insights into how universities' research outputs, technological advancements and innovative processes are integrated into organisations' structural capital. Scholars could investigate the effectiveness of university-community collaborations in enhancing this capital in local organisations. Additionally, studies could explore the contribution of teaching and research activities incorporating sustainability topics to develop new organisational competencies. Researchers could also assess the impact of university-led initiatives on organisational capital and how these initiatives drive technological and sustainability transitions. Finally, future research could analyse how universities can exemplify best practices by renewing their strategies and managerial processes, organisational culture and reporting systems, such as transforming into green campuses, thereby setting a benchmark for sustainable organisational development.

Ultimately, this study may open avenues for interdisciplinary research and prompt scholars to delve deeper into the dynamic relationships between universities and organisational IC within the context of sustainable societal development. The integrated conceptual perspective discussed herein may spark future conversations on the evolving missions of universities to address the specific needs of their local communities and encourage empirical investigations of how they contribute to corporate IC creation with a particular focus on the specific IC forms. Universities can make a resonant contribution to the sustainable growth of the communities with which they interact by building the foundations for future development. They are generators, sharers and carriers of the different and varied forms of knowledge-based capital that organisations across all sectors need to create sustainable value for themselves and their communities. To this end, they are increasingly expected to perform their articulated evolving third (and fourth) mission activities by interacting more closely with businesses, stakeholders, governments and civic society. Universities have the institutional and moral responsibility to foster self-awareness, wisdom and values in individuals to drive positive change towards a sustainable future through the power of knowledge.

References

- Abatecola, G. and Cristofaro, M. (2020), "Hambrick and mason's 'upper echelons theory': evolution and open avenues", *Journal of Management History*, Vol. 26 No. 1, pp. 116-136.
- Abdelbary, I. and Benhin, J. (2019), "Governance, capital and economic growth in the arab region", *The Quarterly Review of Economics and Finance*, Vol. 73, pp. 184-191.
- Abel, J.R. and Deitz, R. (2012), "Do colleges and universities increase their region's human capital?", *Journal of Economic Geography*, Vol. 12 No. 3, pp. 667-691.
- Adams, C.A. (2017), "Conceptualising the contemporary corporate value creation process", *Accounting, Auditing and Accountability Journal*, Vol. 30 No. 4, pp. 906-931.
- Adams, C.A., Heijltjes, M.G., Jack, G., Marjoribanks, T. and Powell, M. (2011), "The development of leaders able to respond to climate change and sustainability challenges: the role of business schools", *Sustainability Accounting, Management and Policy Journal*, Vol. 2 No. 1, pp. 165-171.
- Adams, C., Coulson, A.B., Emmelkamp, T., Greveling, R., Klüth, G. and Nugent, M. (2013), "Capitals background paper for <IR>", available at: www.integratedreporting.org/wp-content/uploads/2013/03/IR-Background-Paper-Capitals.pdf
- Alemu, S.K. (2018), "The meaning, idea and history of university/higher education in Africa: a brief literature review", *FIRE: Forum for International Research in Education*, Vol. 4 No. 3, pp. 210-227.
- Alvino, F., Di Vaio, A., Hassan, R. and Palladino, R. (2021), "Intellectual capital and sustainable development: a systematic literature review", *Journal of Intellectual Capital*, Vol. 22 No. 1, pp. 76-94.
- Aras, G. and Mutlu Yıldırım, F. (2022), "Development of capitals in integrated reporting and weighting representative indicators with entropy approach", *Social Responsibility Journal*, Vol. 18 No. 3, pp. 551-572.
- Astuti, P.D., Datrini, L.K. and Chariri, A. (2023), "Understanding the antecedents and consequences of sustainable competitive advantage: testing intellectual capital and organizational performance", *Economies*, Vol. 11 No. 4, p. 120.
- Audretsch, D.B. (2014), "From the entrepreneurial university to the university for the entrepreneurial society", *The Journal of Technology Transfer*, Vol. 39 No. 3, pp. 313-321.
- Barnett, R. (2016), *Understanding the University: Institution, Idea, Possibilities*, Routledge, Abingdon and New York, NY.
- Bismuth, A. and Tojo, Y. (2008), "Creating value from intellectual assets", *Journal of Intellectual Capital*, Vol. 9 No. 2, pp. 228-245.
- Bontis, N. (1999), "Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field", *International Journal of Technology Management*, Vol. 18 Nos 5/6/7/8, pp. 433-463.
- Bradley, T. (2024), "From TBLA to QBLA: interpreting and redesigning business sustainability education through the business sustainability cycle", in Wall, T., Viera Trevisan, L., Leal Filho, W. and Shore, A. (Eds), *Sustainability in Business Education, Research and Practices*, Springer, Cham, pp. 255-273.
- Budsaratragoon, P. and Jitmaneeroj, B. (2019), "Measuring causal relations and identifying critical drivers for corporate sustainability: the quadruple bottom line approach", *Measuring Business Excellence*, Vol. 23 No. 3, pp. 292-316.
- Cai, Y. and Amaral, M. (2021), "The triple helix model and the future of innovation: a reflection on the triple helix research agenda", *Triple Helix*, Vol. 8 No. 2, pp. 217-229.
- Cai, Y. and Etzkowitz, H. (2020), "Theorizing the triple helix model: past, present, and future", *Triple Helix Journal*, Vol. 7 Nos 2/3, pp. 189-226.

- Cai, Y. and Lattu, A. (2022), "Triple helix or quadruple helix: which model of innovation to choose for empirical studies?", *Minerva*, Vol. 60 No. 2, pp. 257-280.
- Cheikh, I.B. and Noubbigh, H. (2019), "The effect of intellectual capital drivers on performance and value creation: the case of Tunisian non-financial listed companies", *Journal of the Knowledge Economy*, Vol. 10 No. 1, pp. 147-167.
- Chen, C., Vanclay, F. and Van Dijk, T. (2021), "How a new university campus affected people in three villages: the dynamic nature of social licence to operate", *Impact Assessment and Project Appraisal*, Vol. 39 No. 1, pp. 2-10.
- Collins, T.J. (2017), "Review of the twenty-three year evolution of the first university course in green chemistry: teaching future leaders how to create sustainable societies", *Journal of Cleaner Production*, Vol. 140, pp. 93-110.
- Coulson, A., Adams, C.A., Nugent, M. and Haynes, K. (2015), "Exploring metaphors of capitals and the framing of multiple capitals: challenges and opportunities for <IR>", *Sustainability Accounting, Management and Policy Journal*, Vol. 6 No. 3, pp. 290-314.
- Cruz-Amarán, D., Guerrero, M. and Hernández-Ruiz, A.D. (2020), "Changing times at Cuban universities: Looking into the transition towards a social, entrepreneurial and innovative organization", *Sustainability*, Vol. 12 No. 6, p. 2536.
- Cuesta-Claros, A., Malekpour, S., Raven, R. and Kestin, T. (2022), "Understanding the roles of universities for sustainable development transformations: a framing analysis of university models", *Sustainable Development*, Vol. 30 No. 4, pp. 525-538.
- Dane-Nielsen, H. and Nielsen, C. (2019), "Value creation in business models is based on intellectual capital—And only intellectual capital", *Journal of Business Models*, Vol. 7 No. 2, pp. 64-81.
- Dare, M., Schirmer, J. and Vanclay, F. (2014), "Community engagement and social licence to operate", *Impact Assessment and Project Appraisal*, Vol. 32 No. 3, pp. 188-197.
- Dave, M., Gou, Z., Prasad, D. and Li, F. (2014), *Greening Universities Toolkit V2. 0. Transforming Universities into Green and Sustainable Campuses: A Toolkit for Implementers*, UNEP.
- Doni, F., Larsen, M., Bianchi Martini, S. and Corvino, A. (2019), "Exploring integrated reporting in the banking industry: the multiple capitals approach", *Journal of Intellectual Capital*, Vol. 20 No. 1, pp. 165-188.
- Dumay, J. (2016), "A critical reflection on the future of intellectual capital: from reporting to disclosure", *Journal of Intellectual Capital*, Vol. 17 No. 1, pp. 168-184.
- Dumay, J. and Garanina, T. (2013), "Intellectual capital research: a critical examination of the third stage", *Journal of Intellectual Capital*, Vol. 14 No. 1, pp. 10-25.
- Dzimińska, M., Fijałkowska, J. and Sułkowski, Ł. (2020), "A conceptual model proposal: Universities as culture change agents for sustainable development", *Sustainability*, Vol. 12 No. 11, p. 4635.
- Elkington, J. (2018), "25 Years ago I coined the phrase 'triple bottom line.' here's why it's time to rethink it", *Harvard Business Review*, Vol. 25, pp. 2-5.
- Etzkowitz, H. (2017), "Innovation Iodestar: the entrepreneurial university in a stellar knowledge firmament", *Technological Forecasting and Social Change*, Vol. 123, pp. 122-129.
- Etzkowitz, H. and Leydesdorff, L. (2000), "The dynamics of innovation: from national systems and 'mode 2' to a triple helix of university–industry–government relations", *Research Policy*, Vol. 29 No. 2, pp. 109-123.
- Ferenhof, H.A., Durst, S., Zaniboni Bialecki, M. and Selig, P.M. (2015), "Intellectual capital dimensions: state of the art in 2014", *Journal of Intellectual Capital*, Vol. 16 No. 1, pp. 58-100.
- Fijałkowska, J. and Hadro, D. (2018), "Intellectual capital reporting of universities – A third mission oriented approach to communication with stakeholders", *International Journal of Contemporary Management*, Vol. 17 No. 4, pp. 109-132.

-
- Franco, M., Neves, D., Haase, H. and Rodrigues, M. (2023), "The importance of intellectual capital in networks formed by start-ups", *International Journal of Organizational Analysis*, Vol. 31 No. 5, pp. 1435-1460.
- Freudenreich, B., Lüdeke-Freund, F. and Schaltegger, S. (2020), "A stakeholder theory perspective on business models: Value creation for sustainability", *Journal of Business Ethics*, Vol. 166 No. 1, pp. 3-18.
- Guerrero, M., Fayolle, A., Di Guardo, M.C., Lamine, W. and Mian, S. (2023), "Re-viewing the entrepreneurial university: strategic challenges and theory building opportunities", *Small Business Economics*, Vol. 63 No. 2, pp. 1-22.
- Gunasekara, C. (2004), "The third role of Australian universities in human capital formation", *Journal of Higher Education Policy and Management*, Vol. 26 No. 3, pp. 329-343.
- Gupta, U.G., Massa, N.P. and Azzopardi, J. (2016), "Culture and intellectual capital: towards a conceptual framework", *International Journal of Organizational Analysis*, Vol. 24 No. 3, pp. 438-453.
- Hama, N.O. and Cavusoglu, B. (2023), "The sustainability of intellectual capital in enhancing organizational innovation: a case study of Suleimani polytechnic university", *Sustainability*, Vol. 15 No. 15, p. 12068.
- Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *The Academy of Management Review*, Vol. 9 No. 2, pp. 193-206.
- Hatke, F. and Blaschke, S. (2015), "Striving for excellence: the role of top management team diversity in universities", *Team Performance Management: An International Journal*, Vol. 21 Nos 3/4, pp. 121-138.
- Hogner, R.H. and Kenworthy, A.L. (2010), "Moving forward together in sustainable, effective, and partnership-oriented ways: Connecting universities and communities through global leadership service projects", *International Journal of Organizational Analysis*, Vol. 18 No. 2, pp. 245-266.
- IIRC (2021), *International <IR> Framework*, International Integrated Reporting Council, London.
- Imenda, S. (2014), "Is there a conceptual difference between theoretical and conceptual frameworks?", *Journal of Social Sciences*, Vol. 38 No. 2, pp. 185-195.
- Jaeger, A. and Kopper, J. (2014), "Third mission potential in higher education: measuring the regional focus of different types of HEIs", *Review of Regional Research*, Vol. 34 No. 2, pp. 95-118.
- Jakubowska, A. and Rosa, A. (2014), "Significance of higher education in creating of intellectual capital", *Human Resources Management and Ergonomics*, Vol. 8 No. 2, pp. 48-60.
- Klofsten, M., Fayolle, A., Guerrero, M., Mian, S., Urbano, D. and Wright, M. (2019), "The entrepreneurial university as driver for economic growth and social change-Key strategic challenges", *Technological Forecasting and Social Change*, Vol. 141, pp. 149-158.
- Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Ávila, L.V., Brandli, L.L., Molthan-Hill, P., Pace, P., Azeiteiro, U.M., Vargas, V.R. and Caeiro, S. (2019), "Sustainable development goals and sustainability teaching at universities: falling behind or getting ahead of the pack?", *Journal of Cleaner Production*, Vol. 232, pp. 285-294.
- Lüdeke-Freund, F., Rauter, R., Pedersen, E.R.G. and Nielsen, C. (2020), "Sustainable value creation through business models: the what, the who and the how", *Journal of Business Models*, Vol. 8 No. 3, pp. 62-90.
- Malik, S.Y., Cao, Y., Mughal, Y.H., Kundi, G.M., Mughal, M.H. and Ramayah, T. (2020), "Pathways towards sustainability in organizations: empirical evidence on the role of green human resource management practices and green intellectual capital", *Sustainability*, Vol. 12 No. 8, p. 3228.
- Manninen, K., Laukkanen, M. and Huiskonen, J. (2024), "Framework for sustainable value creation: a synthesis of fragmented sustainable business model literature", *Management Research Review*, Vol. 47 No. 1, pp. 99-122.

- Marathe, G.M., Dutta, T. and Kundu, S. (2020), "Is management education preparing future leaders for sustainable business? Opening minds but not hearts", *International Journal of Sustainability in Higher Education*, Vol. 21 No. 2, pp. 372-392.
- Marques, J.P., Caraça, J.M. and Diz, H. (2006), "How can university–industry–government interactions change the innovation scenario in Portugal?—the case of the university of Coimbra", *Technovation*, Vol. 26 No. 4, pp. 534-542.
- Milne, M.J. and Gray, R. (2013), "W(h)ither ecology? The triple bottom line, the global reporting initiative, and corporate sustainability reporting", *Journal of Business Ethics*, Vol. 118 No. 1, pp. 13-29.
- Morawska-Jancelewicz, J. (2022), "The role of universities in social innovation within quadruple/quintuple helix model: Practical implications from polish experience", *Journal of the Knowledge Economy*, Vol. 13 No. 3, pp. 2230-2271.
- O'Neill, M. and Bagchi-Sen, S. (2023), "Public universities and human capital development in the United States", *GeoJournal*, Vol. 88 No. 1, pp. 733-751.
- Paletta, A. and Bonoli, A. (2019), "Governing the university in the perspective of the united nations 2030 agenda: the case of the university of bologna", *International Journal of Sustainability in Higher Education*, Vol. 20 No. 3, pp. 500-514.
- Panneels, I. (2023), "The quintuple bottom line: a framework for place-based sustainable enterprise in the craft industry", *Sustainability*, Vol. 15 No. 4, p. 3791.
- Parsons, R. and Moffat, K. (2014), "Constructing the meaning of social licence", *Social Epistemology*, Vol. 28 Nos 3/4, pp. 340-363.
- Prno, J. and Slocombe, D.S. (2012), "Exploring the origins of 'social license to operate' in the mining sector: perspectives from governance and sustainability theories", *Resources Policy*, Vol. 37 No. 3, pp. 346-357.
- Purcell, W.M., Henriksen, H. and Spengler, J.D. (2019), "Universities as the engine of transformational sustainability toward delivering the sustainable development goals: 'living labs' for sustainability", *International Journal of Sustainability in Higher Education*, Vol. 20 No. 8, pp. 1343-1357.
- Ramísio, P.J., Pinto, L.M.C., Gouveia, N., Costa, H. and Arezes, D. (2019), "Sustainability strategy in higher education institutions: Lessons learned from a nine-year case study", *Journal of Cleaner Production*, Vol. 222, pp. 300-309.
- Salamzadeh, Y., Sangosanya, T.A., Salamzadeh, A. and Braga, V. (2022), "Entrepreneurial universities and social capital: the moderating role of entrepreneurial intention in the Malaysian context", *The International Journal of Management Education*, Vol. 20 No. 1, p. 100609.
- Salinas-Ávila, J., Abreu-Ledón, R. and Tamayo-Arias, J. (2020), "Intellectual capital and knowledge generation: an empirical study from Colombian public universities", *Journal of Intellectual Capital*, Vol. 21 No. 6, pp. 1053-1084.
- Secundo, G., Perez, S.E., Martinaitis, Ž. and Leitner, K.H. (2017), "An intellectual capital framework to measure universities' third mission activities", *Technological Forecasting and Social Change*, Vol. 123, pp. 229-239.
- Sjödin, D., Liljeborg, A. and Mutter, S. (2024), "Conceptualizing ecosystem management capabilities: managing the ecosystem-organization interface", *Technological Forecasting and Social Change*, Vol. 200, p. 123187.
- Stein, S. (2024), "Universities confronting climate change: beyond sustainable development and solutionism", *Higher Education*, Vol. 87 No. 1, pp. 165-183.
- Stewart, T.A. (1997), *Intellectual Capital: The New Wealth of Organizations*, Doubleday Dell Publishing Group, New York, NY.
- Swart, J. (2006), "Intellectual capital: disentangling an enigmatic concept", *Journal of Intellectual Capital*, Vol. 7 No. 2, pp. 136-159.

- Tajbakhsh, A., Nematollahi, M. and Shamsi Zamenjani, A. (2024), "Migration to the quadruple bottom line framework for achieving sustainable development goals: the 4Ps of sustainability", *Annals of Operations Research*.
- Todericiu, R. and Șerban, A. (2015), "Intellectual capital and its relationship with universities", *Procedia Economics and Finance*, Vol. 27, pp. 713-717.
- Trencher, G., Yarime, M., McCormick, K.B., Doll, C.N.H. and Kraines, S.B. (2014), "Beyond the third mission: exploring the emerging university function of co-creation for sustainability", *Science and Public Policy*, Vol. 41 No. 2, pp. 151-179.
- Trequattrini, R., Lombardi, R., Lardo, A. and Cuzzo, B. (2018), "The impact of entrepreneurial universities on regional growth: a local intellectual capital perspective", *Journal of the Knowledge Economy*, Vol. 9 No. 1, pp. 199-211.
- Van, L.T.H., Vo, D.H., Hoang, H.T.T. and Tran, N.P. (2022), "Does corporate governance moderate the relationship between intellectual capital and firm's performance?", *Knowledge and Process Management*, Vol. 29 No. 4, pp. 333-342.
- Vien, H. and Galik, C.S. (2024), "Individual and interlinked SDGs: higher education institutions and metro area sustainability performance", *International Journal of Sustainability in Higher Education*, Vol. 25 No. 5, doi:[10.1108/IJSHE-06-2023-0231](https://doi.org/10.1108/IJSHE-06-2023-0231).
- Zawdie, G. (2010), "Knowledge exchange and the third mission of universities: introduction: the triple helix and the third mission—Schumpeter revisited", *Industry and Higher Education*, Vol. 24 No. 3, pp. 151-155.

Corresponding author

Carla Del Gesso can be contacted at: carla.delgesso@unimi.it