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Editorial

Governing New and Traditional Partnerships for Innovation and Development in the Post-Pandemic World

The models and approaches based on the concept of the Triple Helix (Leydesdorff and Etzkowitz, 1998) have followed a co-evolution path with the major theories of innovation systems (national and regional innovation systems etc.) and have been integrated in most innovation theories, whether explicitly admitted or not. The concept has been cited thousands of times and used in scientific papers, conference presentations and in political discourse. This has been a remarkable achievement. The Triple Helix Association and its global Conferences are among the most important arenas for taking stock of the impact of the concept that still enjoys considerable notoriety among scholars involved in innovation studies, worldwide.

The 20th Triple Helix conference, which was hosted by the University of Florence in June 2022 (https://www.triplehelixconference2022.org/), marked therefore a long history of global conferences. Nonetheless, it was different from the past ones in some respect. It was realized in a hybrid form (in-person and online at the same time). This was a challenge that went beyond the technological issues linked with connectivity and online sessions. After the acute phase of the pandemic, it allowed participants to gather face-to-face and online and discuss innovation challenges, in a quite seamless way. The focus of the conference was also timely related to the pandemic and the post-pandemic world.

The theme of governance of traditional and new systemic innovation partnerships was at the core of the ongoing reflections, as major reconfigurations had started to take place in all significant structures and organisations linked

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with the constituents of the Triple Helix (new working methods and deliberation processes, new educational environments, major upheavals in cities and regions, extreme social impacts in terms of employment and reconfiguration of business structures). The development dimension was stressed as well, first because well-addressed innovation is a *sine qua non* for economic development, jobs, and sustainability and, second, because the pandemic has had profound negative impacts on the world's societies and economies on an unprecedented scale, setting back development trajectories almost everywhere on the planet, devastating lives and livelihoods of millions of individuals, creating global disruption to all known regional development patterns, and changing the rules of the development game. The challenge of reducing human contact underpinned technological solutions and accelerated their adoption, yet it modified work and life practice and led to economic upheaval, especially among many small and medium-size companies unaware or unable to follow the new ways of doing business. Impacts extended to important negative changes for inner cities, central business districts, housing, and transport. Such phenomena coupled with the mounting wave of the digital-based technological revolution, the continuing climate crisis, and the war brought by the Russian Federation to Ukraine. All together were contributing to create an economic and social environment of wicked problems and great challenges. Many innovation systems tried to prioritise resilience and recovery, deploying considerable inventiveness and a new partnership spirit, experimenting with wider and more complex helical models that build on the Triple Helix and seem to expand to Quadruple and Quintuple Helix patterns (Carayannis and Campbell, 2010).

These themes are also the intellectual universe that the present Special Issue focuses on, after the special Call that was addressed at the papers presented at the Conference under the title of '*Governing new and traditional partnerships for innovation and development in the post-pandemic world*'.

The four research articles collected and presented here cover several aspects of the Triple Helix discourse and explore an impressive range of subjects related to the title of the Special Issue. Indeed, they converge in their findings in what we could call a loose congregation of attributes for successful helical governance, specifically: the need of broad assessment frameworks for University activities when trying to connect to businesses in less-economical developed or developing areas (Liche and Střelcová, 2023); the importance of experimental (Triple Helix) spaces for connecting together potentially strong but fragmented innovation players (Pokidina et al., 2023); the weighting of spatial, organisational, economic and social factors when evaluating the performance of innovation districts for urban and regional innovation

and development (Rapetti et al., 2023); and the evolving helical patterns that support local productive systems involved in sustainability transitions (Donati et al., 2023). Let us recall some more detail about the four papers.

Liche and Střelcová (2023) deal with the issue of the inner workings of universities when interacting with external players, focusing on the way universities evaluate their technology development processes and how these fit in the Triple Helix innovation model. They adopt a novel approach by bringing in insights from Organizational control theory and the Context, Input, Process and Product evaluation model. They apply such approach and transcribe the helical issues in a Global South perspective, specifically that of Ethiopia, identifying a set of important enablers and barriers (Razak and White, 2015; Williams and Woodson, 2012). The paper suggests that the evaluation should be people-based and aimed at supporting the building of fruitful relationships among different actors that bring helix identities with informal and hybrid characters in contexts of scarcity (including technical skills). This perspective is crucial as well in the post-pandemic era, as regions and local productive systems in both developing countries and left-behind areas of developed countries strive to grow or renew their internal capacities and to reduce external dependencies (Da Silva et al., 2021).

Pokidina et al. (2023) address a governance experiment building on the opportunities caught by a university in Finland that elaborated on the revamping of capacities and skills struck by technological obsolescence. The paper explores the development opportunities and dynamics provided by a collaborative governance scheme, where the knowledge institution interacts with policy and business actors to develop re-skilling and re-education opportunities, for revitalizing a declining local business community. They explore the potential of institutional work in a protected niche, i.e., at the periphery of the academic institution, following a stepwise process guided by a three-pronged framework (boundary, distancing, and anchoring work). It is an original way to refer to the 'entrepreneurial' university (Etzkowitz, 1983; Clark, 1998), precisely as the outcome of a process pivoting on experimentation in institutional peripheries (see also Castro-Spila and Unceta, 2014; Towers et al., 2020). They use the concept of *Triple Helix spaces* (Ranga and Etzkowitz, 2013) to address the question of how university-based experimental spaces might mobilize hidden capacities for institutional innovation in the field of higher education if supported by effective methods and engaged helical leaderships.

Turning the attention to the link between innovation and its spatial nexus, Rapetti et al. (2023) elaborate on the inner workings of Innovation Districts (ID), by using a composite method of assessment based on a multi-criteria analysis, in a sophisticated mix of qualitative and quantitative methods. The

basic underpinning idea is that to be successful contemporary urban development needs to rely heavily on the knowledge economy combining sustainability and innovation (Pareja-Eastaway and Pique, 2011; Yigitcanlar, 2011), and that Innovation Districts are sub-systems that can allow support to such combination along the four dimensions of urban, social, economic and governance relations. The study confirms the positive and crucial role of helical interactions, in all their dimensions.

Donati et al. (2023) propose a conceptual framework where the agency dimension of the fifth helix is made explicit and combined with evolving helical patterns (Cai and Lattu, 2021) supporting systemic innovation that drives local productive systems to sustainability transitions. The framework is applied to an Italian case where the helical process started following what appears to be a triple helix pattern. However, from the beginning, the process carried informal quadruple and quintuple helix functions thanks to actors moving in hybrid domains (Aoyama and Parthasarathy, 2016). Such processes met soon local communities and environmental needs. The evolving helical patterns saw the progressive inclusion of actors with specialized natural ecosystem or bioeconomy expertises as well as hybrid autonomous organizations (Champenois and Etzkowitz, 2018) operating at various governance levels. Eventually, such multi-level and multi-actor evolving patterns suggest that the explicit contribution of fourth and fifth helices' actors and functions to systemic innovation, such as that implied in sustainability transition, should be understood not as a ready-to-use solution but as an emergent and complex process, expanding what was already evoked by Ranga and Etzkowitz (2013) for the constitution of triple helix partnerships. This also combines with illustrations of stepwise processes in helical partnerships, which we have seen in other papers of the Special Issue.

We conclude this Introduction proposing three hints on lines of theoretical and empirical research based on helical approaches, which emerge from the Special Issue and that connect with the recent debates hosted also by this Journal (see Amaral and Cai, 2022).

It is well-known that the Triple Helix innovation model refers to a set of interactions between academia (universities and other knowledge institutions), industry, and government to foster economic and social development. The knowledge institutions have been playing an enhanced role in increasingly knowledge-based societies (Etzkowitz and Leydesdorff, 2000; Piqué et al., 2020). Elaborations of the Triple Helix theory have followed either neo-institutional or neo-evolutionary perspectives (Cai and Amaral, 2021). The former emphasizes the relations between the three spheres, while the

latter stress the mechanisms of Triple Helix interactions. Three sub-dynamics are suggested by the model as crucial: the economic dynamics of the market, the political dynamics of control, and the socio-cultural dynamics of knowledge creation and communication (Leydesdorff and Zawdie, 2010). We have already recalled above the launch in the last fifteen years of proposals that point to more complex helical patterns, with the quadruple helix adding a fourth component to the framework of interactions between university, industry, and government: the public, consisting of civil society and the media. Another emanation, the quintuple helix, further expands on the quadruple helix by including the natural environment as a fifth component. These proposals have met great interest, also in empirical applications, as well as debates and criticisms (Amaral and Cai, 2022; Lawton Smith and Leydesdorff, 2022). Some contributions in this Special Issue touch on such themes, as we have recalled above.

Here, as a first hint, we would like to underline a related point, i.e., that the impact that such innovation partnerships and dynamics have at various territorial levels may be mediated by complex stakeholders' fora that help engage local players in development initiatives, programmes and projects of various intensity and depth. This has been particularly well illustrated in the case of Smart Specialisation Strategies (Foray et.al, 2009), where such fora had to oversee the so-called Entrepreneurial Discovery Process, meant to identify new opportunity spaces, priority sectors and projects. Also, thanks to such fora, social innovation may be acknowledged an increasingly important role in development initiatives, associated with more active civil societies and knowledge institutions (universities and research centres) that experiment with new forms of 'extended social function' (Cesaroni and Piccaluga, 2016). However, the situation on the ground is often very complex, as the helical partnerships are easily incomplete and variegated, and actors may take hybrid functions and perform in combinations that are context specific (Bellandi et al., 2021). The multiplicity and variety of actors and the complexity of helical dynamics may at times reflect exaggerate expectations from participating actors and thus overload their mission (Benneworth et al, 2017). This is frequently the case with the so-called Third Mission of universities that calls for extended interaction with the society and the economy, although the legal frameworks and the academic organizational structures do not always support such enhanced functions (Kempton, 2019). Additional issues are created when the recipient regions are not well prepared to collaborate with knowledge institutions (lack of institutional thickness) or the surrounding entrepreneurial ecosystems are weak (Kempton et al., 2021).

A second hint concerns role and impact of multi-level governance – a concept that is inherent in all the papers of this Special Issue. Multi-level governance is essential for managing the new emerging forms of innovation partnerships that may be more complex than the traditional Triple Helix ones, especially when they aim at impacting on paths of regional innovation and development. The term governance refers to the way power is distributed vertically between many levels of government and horizontally across constellations of semi-governmental and non-governmental organizations and other players that share policymaking responsibilities. The concept itself is at the core of many studies in European Integration. Multi-level governance is characterized not only by the dispersion of power from central governments to other centres (Piattoni, 2008) but also by the coordination of strategies across and within the levels (Bellandi and Caloffi, 2016). One of the critical issues to be addressed in multi-level governance concerns institutional synergies and how these affect place-based innovation policies. An important aspect is the horizontal coordination between governments, businesses, knowledge institutions and the civil society that involve the creation of new policy instruments. Such policy instruments bring together learning and communities of practice and may be helpful to spur local innovation.

These aspects call for considering explicitly the issue raised implicitly at the end of the previous point, i.e., that of an effective management of complex and possibly multi-level helical partnerships for innovation. It requires a bent for the subtle science of building relationships. It needs the definition of efficient indicators to quantify and monitor the most important part of the system, i.e., the interactions between its constituent parts and the knowledge and action capabilities brought by each of them. Cultural differences must be understood deeply, as, for examples, knowledge institutions have largely different agendas than the business community with which they are supposed to interface. Lack of trust adds to the problems related to different agendas and can undermine possibilities of collaboration and effective outputs. One of the thorniest sides in this field is the management of intellectual property. Systematic work from all the actors involved is needed to face such difficulties, with active participation of institutional leaderships and the establishment of multi-level communication channels to get the message across.

The third hint concerns the strong and increasing push that the great contemporary challenges, with their wicked societal problems, give to researches on helical partnerships and dynamics for systemic innovation geared towards place-based sustainable development. Environmental, societal, and

governmental (ESG) factors need to be integrated in multi-level and multi-dimensional frameworks of governance. Sustainability is not negotiable and should be integrated in any human-driven strategy in the future. Inevitably, it will mean (among other things) an increase in top-down conditionalities that may pose issues when considered with bottom-up initiatives and strategies – again a problem of multi-level governance. An example is the current European Union Green Deal strategy that tries to provide a holistic framework towards the Green and Digital transitions (McCann and Soete, 2020). On a Global South perspective, systemic innovation for dramatic sustainability needs can emerge from creative outbursts fuelling potential helical partnerships (Arocena and Sutz, 2021). They might try to face such needs against barriers that are usually very high (Williams and Woodson, 2012), included a scarcity of traditional technological resources. Here, lessons also for the economically advanced countries can be learned (Petersen and Kruss, 2021). Indeed, technological solutions are important, but they will never be sufficient (Thomas and Pugh, 2020). The context, the actors, the process, and the outcomes, will be the critical parameters to consider when designing systemic innovation for sustainability (Dabard and Mann, 2023), hopefully incorporating the management of drivers and barriers that have been identified in general terms since some time ago (e.g., Dearing, 2000).

Sustainability-focused innovation involves wider ranges of stakeholders with potentially contradictory demands, making it more complex and ambiguous compared to conventional innovation. Balancing social, environmental, and economic considerations requires navigating through complex trade-offs and finding innovative solutions that satisfy multiple objectives. Current climate, geopolitical and economic uncertainties add to this picture. Furthermore, other traditional factors (resistance to change, lack of resources, regulatory barriers) may further complicate the scenario.

It is certain that we will need more research to better understand all the complex dimensions of this new reality, but we can stay confident about the heuristic and operative power of the models that have developed upon the Triple Helix concept as, among other recent contributions, the papers of this Special Issue suggest. Helical partnerships and dynamics can bring in new considerations in terms of governance, systemic interactions and understanding, creating favourable conditions for sustainable innovation at regional level.

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