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Social Ecosystem Model 2.0.

From place-based lifelong learning and skills to systems for societal transitioning

Think piece

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Ken Spours

UCL Institute of Education and the

College of Education, Capital Normal University, Beijing

Abstract

This discussion paper explores the conceptual evolution of an inclusive Social Ecosystem Model (SEM) that connects the realms of Working, Living, and Learning. It argues that the prevalent use of metaphorical devices in human conceptual methods should be superseded by social ecosystem theory, which can guide the creation of inclusive and sustainable social ecosystems. The development of the theory-based SEM stems from merging spatial adaptations of Bronfenbrenner's human ecological scalars with extensions to Finegold's high skills ecosystems approach, leading to SEM 1.0. This model was further expanded within a broader '45-degree political economy and ecology framework,' emerging as SEM 2.0. The comprehensive SEM framework suggests that skills ecosystems function as a sub-system within both SEM models. SEM 1.0, with its focus on Working, Living, and Learning, has been applied to the development of vocational education and training (VET) in England. This application charts a conceptual path away from the dominant top-down market model towards a devolved, social, and place-based approach. The final part of the paper examines the potential role of SEM 2.0 in facilitating sustainable and equitable Just Transitions. The paper also acknowledges the significant contributions of South African colleagues (Africa VET 4.0 Collective) through their publications and the organization of the workshop 'Skills Ecosystems and Just Transitions' at Witwatersrand University, Johannesburg, in November 2023. Their appreciation of the potential of the SEM, along with critiques of its speculative nature and lack of groundedness, leads the paper to pose questions of 'emergence' and 'contingency' to explore the necessary conditions for the model's development in rapidly changing contexts.

Key words – Social Ecosystems, Skills Ecosystems, 45-degree Change, Just Transitions,

Part 1. Human ecological and ecosystem thinking – context and evolution

Two variants of social-ecological system thinking

Social-ecological system (SES) thinking, focusing on relationships between Humanity and the natural world (Ostrom, 2009), has grown in recent decades due to the challenges of understanding the complexities of economies and societies in the era of globalization (Saiz, 2005; Young et al., 2006) together with a growing poly-crisis, resulting from the entanglement of the climate-nature emergency with other global crises of inequality, conflicts, and mass migrations (Homer-Dixon et al., 2024).

This paper does not intend to cover the entirety of SES thinking but focuses on elaborating a specific variant—the Social Ecosystem Model (SEM) - and its evolution from SEM 1.0 to a full ‘political economy, ecology’ framework (SEM 2.0). A review of the relevant literature reveals two distinct yet related approaches. The first, and most prevalent, emphasizes the dynamic relationship between human actions and natural ecological systems, functioning as a composite unit. This approach highlights issues such as adaptive ecosystem governance (Folke et al., 2005), stewardship of resilient natural systems (ref), and the incorporation of local knowledge in these processes (Andersson et al., 2021). The second variant involves transferring ecological concepts from the natural world to the human and social realms to better understand the complexities of modern, globalized societies (e.g., Bronfenbrenner, 1979; Barnett & Jackson, 2020). The second variant has mainly utilised ecological metaphors as a ‘bridge’, suggesting a more indirect relationship between the natural and human worlds than the first approach and forms the starting point of an evolving Social Ecosystem Model.

Despite deploying similar core terms and principles such as balance, resilience, and adaptability, the relatively autonomous nature of the second variant allows for the application of social ecosystem ideas to complex dynamics across different societal sectors as part of a broader development mission. This form of SES thinking, that uses theory rather than metaphor, is better able to recognize the shaping roles of economic and political power (Spours, 2024). Rather than marking a departure from the natural world, the emerging social ecosystem dynamic within a ‘political–economy–ecology’ framework (SEM 2.0), refocuses on the climate and nature crisis with post-anthropogenic thinking and strategy (Ramsarup & Rousson, 2023). The final section of this think piece explores how Variant 2 returns to the concerns of Variant 1, applying the expanded social ecosystem model to the Just Transition.

Responses to complexity and crisis

In response to growing societal complexity, the second variant of SES thinking has used metaphors to reflect on a growing range of human and organizational activities, including child development and special needs (e.g. Bronfenbrenner, 1979; Rosa & Tudge, 2013), communication and information systems (e.g., Nardi & O'Day, 1999), business innovation (e.g., Bollier, 2000), deliberative governance (e.g., Hajer and Wagenaar, 2003), skills development (e.g., Finegold, 1999; Buchanan, 2006; Hall & Lansbury, 2006), and higher education, learning, and professionalism (e.g., Barnett, 2010; Sambell et al., 2017). Social ecological/ecosystem thinking has also expanded to include urban planning and sustainable cities (e.g., Andersson et al., 2021), public health and community well-being (e.g., Ramaswami et al., 2016), and climate change adaptation and resilience (e.g., Folke et al., 2021). These applications, in increasingly varied settings, emphasize the interconnectedness of different facets of societal development and the importance of collaborative governance to address complex global challenges.

Conceptual connections between the natural and human worlds have been accompanied by a distinct set of values. Unlike the Darwinian interpretation of evolution and the survival of the fittest, ecological and ecosystem thinking emphasize interdependency, organic growth, collaboration, and sustainability (Chapin et al., 2010). At a time when many despair about chronic human crises and struggle to envision a viable future this type of connective and holistic thinking, along with its nature-human value system, offers possibilities for futures we can shape and develop rather than being resigned to simply living with crises in what Pollitt referred to as the 'expanded present' (2008).

Ecologies and ecosystems – conceptual distinctions

The terms 'ecologies' and 'ecosystems,' traditionally associated with the natural world, describe the dynamic interactions between plants, micro-organisms, animals, and their environment. These terms encompass several concepts that explain their function as complex and dynamic systems. Key concepts include the ideas of a self-organizing functioning unit, interdependent relationships, and processes of adaptation, balance, stasis, and development. Natural systems also exhibit features of fragility and resilience, shaped by 'keystone' species within the ecology or ecosystem (Davic, 2003), and are influenced by external forces (Teixeira & Fernandes, 2020).

In the context of developing the Social Ecosystem Model, it was considered important to distinguish between the terms 'ecologies' and 'ecosystems.' Established literatures in the field define 'ecology' as the scientific study of the interactions among organisms and their environment, encompassing various levels of organization from individuals to populations and communities. In contrast, an

‘ecosystem’ refers to a specific community of living organisms interacting with their environment as a functional unit (Hartmann, 2024).

Hodgson and Spours (2013; 2015) also distinguish between these general and specific meanings, suggesting that the term ‘ecology’ can be used generically to describe any system of interdependent relationships, regardless of their condition. Thus, in both natural and human contexts, an ecology can range from impoverished to flourishing. Conversely, the term ‘ecosystem’ is given specific qualities aimed at supporting progressive change; being viewed as a positive, self-sustaining dynamic that develops at interlinked levels or scalars, contrasting with the negative condition of ‘static equilibrium’ (Hodgson & Spours, 2016).

Given the primary aim of holistic system thinking to address prevailing complexities and crises, here the adapted term ‘ecosystem’ has been further imbued with social and political character; an addition that marks a break with the nature-based concept. Social ecosystems do not develop or rebalance naturally; they must be nurtured and constructed by human actors (Ostrom, 2009), working individually and collectively through processes of ‘system mediation’ (Spours, 2024b).

Human ecological thinking – from metaphor to theory

In varied ways both variants of SES thinking speak to the conditions and progressive aspirations in the 21st-century – responding to societal complexity and the climate/nature crisis by visions and strategies of sustainable development across multiple societal landscapes. This form of system thinking has largely used the ‘metaphorical device’ to connect with and to transfer ideas of system dynamics from the natural to the social world; an approach that demonstrates both strengths and limitations.

Metaphors (the Greek root means to transfer or to carry) have been used to assist human understanding by connecting images of two different things—one familiar and the other less so—to act as a ‘bridge’ between the concrete and the abstract (Lakoff & Johnson, 1980). The transfer of key concepts of the natural world to the human and social worlds was originally viewed by scholars of the Chicago School as an extension of the original domain to aid understanding of processes of complexity and change (Park and Burgess, 1924). The use of the metaphorical device has evident strengths, but also limitations. In the process of metaphorical transfer meanings can change and there may come a point when differences between the original usage and the new meaning become too great and act to undermine the plausibility of transfer (Weingart and Maasen, 1997). In the context of a widening gap, the metaphor moves from being ‘correlational’ to ‘analogous’ (Casasanto, 2014). In this less rigorous condition, the metaphor either needs to be further developed or retired. What follows is a

developmental path that moves beyond the metaphorical device through whole-system theory building of a Social Ecosystem Model.

Building social ecosystem theory and the evolution of the Social Ecosystem Model

The development of the SEM (2006 – present) has been intimately linked to specific educational, political and research contexts and challenges. In response, each phase of development of the concept has seen an expanding scope – from Local Learning Ecologies as integrated systems of lifelong learning; to the SEM 1.0 place-based model of economic development and VET; and now the SEM 2.0 focus on societal and Just Transitioning.

This conceptual expansion has been marked by five conceptual steps.

1. Spatial adaptation of Bronfenbrenner’s human ecological scalars to produce a multi-level social ecosystem.
2. Extending Finegold’s High Skills Ecosystem elements to provide social ecosystem dynamics.
3. Critique of Elite Entrepreneurial Ecosystems to envision an inclusive Social Ecosystem Model.
4. Formation of the Working, Living, Learning Nexus to expand the scope of VET – SEM 1.0
5. Introduction of a 45-Degree Change model and the development of a political economy, ecology framework focused on societal transitioning – SEM 2.0.

The advancement of Step 5 and the extension of traditional political economy perspectives through political ecology has been pioneered by South African colleagues from the Africa VET 4.0 Collective at Witwatersrand and Rhodes Universities, stimulating post-anthropogenic thinking in the Global South (see Lotz-Sisitka et al., 2021; Ramsarup, Lotz-Sisitka, & McGrath, 2022; Ramsarup & Rousson, 2023). Their important contribution is further analysed in the final part of the think piece. However, before elaborating the expanded SEM 2.0 framework, it is important to review the historical emergence of SEM 1.0 and its role in conceptualising local lifelong learning systems and place-based VET in the English context.

Part 2. Local learning ecologies and lifelong learning systems (2007-2015)

“A Local Learning Ecology (LLE) is a conceptual framework that recognizes the interconnectedness and interdependence of various institutional and place-based factors at local and sub-regional levels, emphasizing the importance of collaboration among different educational providers to support social inclusion and lifelong learning” (Hodgson and Spours, 2009).

In the context of the evolution of the SEM, the earliest work developed the concept of ‘Local Learning Ecologies’(LLEs), focusing on the role of further education (FE) institutions in localities and communities in England. In the context of New Labour’s third and final administration, this theoretical work originated within the Teaching and Learning Research Programme (TLRP 2000-2010) and a funded project ‘Learning and Inclusion in the Learning and Skills Sector’ (Coffield et al. 2008). A key aim of this research was to explore potential inclusive and place-based models of further education in a governance context of New Labour’s top-down managerialism (Diamond, 2015). At this early stage of the social ecosystem model, the concept of mediation was already in use to assess the ability of FE colleges to creatively ‘translate’ national policy and mediate policy levers and market mechanisms in responding to local learning needs (Spours, Coffield & Gregson, 2007). The idea of a place-based LLE was subsequently applied to an analysis of governance of lifelong learning in England that emphasized the importance of local collaboration between various learning providers and stakeholders to create more inclusive and effective local lifelong learning systems (Hodgson & Spours, 2009).

The LLE perspective evolved swiftly under the impact of the Conservative-Liberal Democrat Coalition (2010-2015) to consider different versions of ‘localism’ – managerial, market and democratic- (Hodgson & Spours, 2012), in which third variant promoted the idea of collaborative local networked governance embracing a range of social partners. Researching learning ecological dynamics in action was supported by partnership working with local education authorities, teachers and students in a variety of socio-economic settings focusing on promoting learner progression through the 14-19 education (upper secondary) phase. The aspiration of developing a connective LLE was supported by Finegold’s concept of High Skills Ecosystems, leading to the concept of a ‘High Skills and Progression Ecosystem’ (Hodgson and Spours, 2013) in the context of VET. Conversely, partnership-based research in a deprived coastal town in eastern England, focused on the contextual factors negatively affecting learner participation, attainment and progression. Reflections on the Finegold and Soskice (1988) concept of a ‘low skills equilibrium’, detailing a range of factors depressing demand for skills in England in the 1980s, led to the development of its educational equivalent - a ‘Low Progression Equilibrium’ (Hodgson & Spours, 2015).

The initial focus of the LLE conception was primarily on the governance and organization of vocational education and lifelong learning, with curriculum and educational processes largely overlooked. However, more recently the concept of 'learning ecologies' was critically reviewed from a SEM 2.0 perspective (Spours, 2024a). Literature on learning ecologies suggests that the concept has emerged not only in response to growing societal complexity, but also as a counter to the dominant neoliberal education reform process—characterized by standardized, performative, mechanistic, and politicized models of education associated with the Global Education Reform Model (GERM) [Sahlberg, 2012; Yoon, 2024].

Posited as a more flexible and expansive approach to education, the concept of learning ecologies emphasizes learning beyond the formal classroom and compulsory schooling—learning throughout the life course [Sangra et al., 2019], in various societal settings (Hecht & Crowley, 2020), the role of community and networks in learning (Siemens, 2008), combinations of formal and informal learning (Wilkinson et al., 2022), the impact of physical space on learning (Herzog, 2007), the role of learning places other than schools (Rettig, 2009), and understanding connections between classrooms, their communities, and different learning sectors (Damsa & Jonet, 2016).

The settings of learning ecologies are necessarily varied but share the common feature of being conceived as being beyond the formal classroom. Learning ecologies thus occupy multiple spaces on different scalars, linking individual learners to communities, localities, and national systems. As spatialized entities, they also evolve over time, experienced as learning throughout the life course. Their spatial and largely local nature raises the issue, once again, of educational governance and the facilitating and collaborative roles of institutions and local government. Interest has been paid to 'middle range' levels of governance (regional and local government) that have had their strategic functions eroded by neoliberalism in recent decades (Newman, 2014). In the evolution of the SEM with its governance focus, Bronfenbrenner's multi-level human ecological system (1979) and ecosystem elements of Finegold's High Skills Ecosystem model (1999) made early contributions to the emergence of SEM 1.0 applied to the field of learning and skills (Hodgson & Spours, 2013; 2015).

Part 3. Theoretical steps to SEM 1.0

‘A social ecosystem is conceived as an evolving, place-based social formation that creates synergies connecting the worlds of working, living and learning with the purpose of nurturing inclusive, sustainable economic, social and educational development in diverse communities, localities and sub-regions’ (Hodgson & Spours, 2018).

SEM 1.0 emerged in the context of research in a global city – the East London Vocational and Education Training (ELVET) Project - funded by the JP Morgan Foundation, that included a study of the impact of the dynamics of the City of London’s financial and technological (FinTech) central business district on patterns of working, living and learning in East London boroughs. Of particular interest was the effect of converging journey to work patterns into the City of London (rather than well paid jobs being available locally) and the effects of gentrification on the affordability of housing. Research on the radial influences of central business districts led to a critique of ‘elite entrepreneurial ecosystems’ (Hodgson and Spours, 2018), giving birth to the idea of an inclusive SEM. This stage of model building also involving a critique of FinTech entrepreneurial ecosystems (e.g. Maleki 2011, Mason and Brown 2013) that subsequently led to critical reflections on High Skills Ecosystems (Finegold 1999), resulting in conceptual extensions of the existing Skills Ecosystem approach (e.g. Buchanan et al., 2017) to include sustainable living through what became termed the ‘Working, Living and Learning Nexus’.

The theoretical construction of SEM 1.0 has involved several conceptual adaptations, extensions and critiques of existing human ecological and ecosystem ideas.

1. Bronfenbrenner’s multi-level ecological scalars and their spatial adaptation

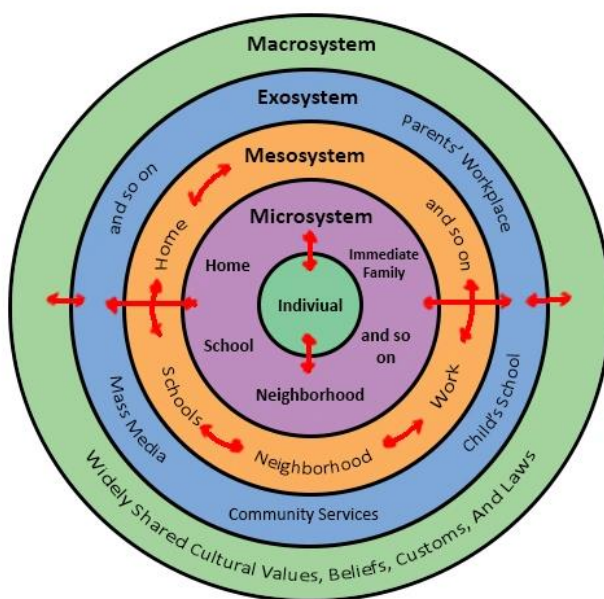
The seminal work of Uri Bronfenbrenner (1979) on human ecology conceptualized child development within a set of nested ecological systems across four interlinked levels – micro, meso, exo and macro - each with an increasingly expansive scope. This framework provided novel ways of understanding the connections between individuals and broader societal influences, enhancing comprehension of the interlocking environments that affect child development. In this context, Bronfenbrenner’s interdependent ecological systems can be seen as employing theoretical constructs rather than mere metaphors.

Focusing on moving away from the English market-driven further education model and towards the development of place-based vocational education and training (VET), Hodgson and Spours (2013, 2015) applied Bronfenbrenner’s ecological system levels with an explicit spatial and governance

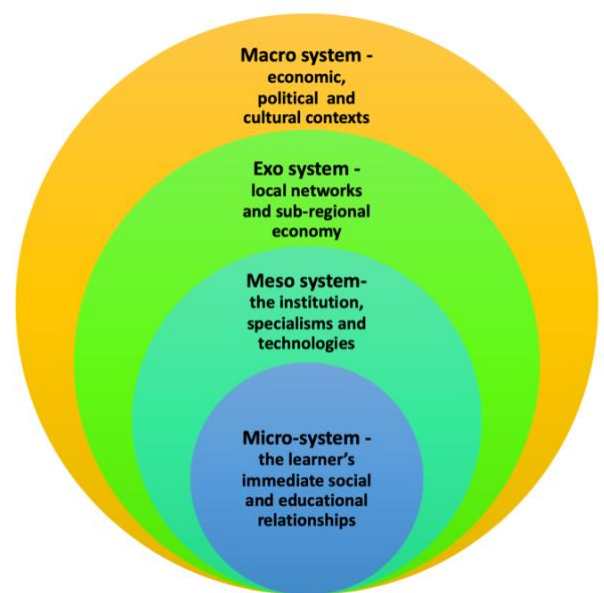
emphasis. Comprising the micro-, meso-, exo-, macro- and chronosystem levels, Bronfenbrenner's human ecological system (1979; 1994) has been adapted from its original focus on the linked systems influencing the development of the child, to conceptualise the wider spatial, organisational and political economy characteristics of VET and lifelong learning (see Figure 1).

Figure 1. The spatial and political economy adaptation of Bronfenbrenner's human ecological scalars

Bronfenbrenner Human Ecological Model



Hodgson & Spours Spatial & Governance Model



- 'Microsystem'—comprises the learner's immediate family environment and their immediate learning relationships and thus stays close to the original Bronfenbrenner formulation.
- 'Mesosystem'—the original concept of the mesosystem as comprising two or more micro systems has been given a more organisational emphasis in the adapted model, focusing on learning and skills institutions and their complex spatial relationships.
- 'Exosystem'—the original definition focused on settings operating beyond the meso- and microsystems that, nevertheless, influence the development of the child. In the adapted version, the exosystem is conceived through a political economy lens to be concerned with 'middle range' factors and forces—the influence of the characteristics of the locality, regional economy and

distributed technologies that link the learner and their organisational settings to the wider economy and society.

- d. 'Macrosystem'—in the adapted model, Bronfenbrenner's original cultural system in which the child is immersed, is viewed more broadly as the totality of socio-economic, political and ideological relationships directly affecting learning and skills development.
- e. 'Chronosystem'—the original focus on the life transitioning of the child is also given a more systemic focus in the adapted model, referring not only to the patterning of learning and transitions over the life course, but importantly the evolution of the SEM and its socio-political ecosystem framework. The chronological evolution of the totality of relations is understood here as 'social ecosystem time'.

This political economy adaptation of the Bronfenbrenner ecological system levels suggested two conceptual possibilities. First, it provided an understanding of the trajectory of a personal ecosystem for learning and skills. A child, for example, will find that their learning is largely confined to the microsystem of immediate social relations (e.g., the family) and the meso level (e.g., school), whereas a young adult may traverse not only these-levels, but also local exo-scalars as part of vocational education and training. Second, related to these expanded horizons for action, the spatial model emphasised the mediating role of 'middle range' settings—the meso level (organisations for learning, their specialisms and technologies) and the exo level (local, sub-regional economic terrains)—that lie between individual learners and a national education and training system. This adaptation also aided analysis of local and regional economic and skills ecosystem dynamics, highlighting the importance of the 'middle tier' of political and social relations—the local levels of state and civil society where factors and forces for skills, economic, and social activities are essentially played out. These spatial distinctions also resonated with devolution debates and emphasized the importance of intermediate collaborative governance relations that lie between individual institutions and national governments, which have been marginalized in the neoliberal era (Hodgson and Spours, 2012; Jessop, 2014).

2. Elements of High Skills Ecosystems' (HSEs) – providing social ecosystem dynamics

While the adapted Bronfenbrenner human ecological scalars provided graduated terrains (essentially localized) for conceptualizing the provision and governance of VET and lifelong learning, the model still lacked a dynamic element to connect the levels. Attention thus turned to the High Skill Ecosystem work of Finegold (1999), who identified four inter-related 'elements' to explain the creation of

exceptional growth and wealth producing High Skill Ecosystems (HSEs) in the US Silicon Valley in the 1990s.

1. Catalysts' that trigger development (e.g., the original impulse of military spending, government demand and investment).
2. 'Nourishment' from world-class research universities that have provided a stream of new talent.
3. 'Supportive environment', including physical infrastructure such as transportation and housing.
4. 'Interdependence' and co-operation between the actors in the region based on flatter hierarchies within enterprises, together with strong local and regional networks.

Silicon Valley ecosystem growth dynamics were also contrasted to the 'Low Skills Equilibrium' (LSE), that conceptualised systemic low employer demand for skill the 1980s UK economy (Finegold & Soskice, 1988). Like the Bronfenbrenner human ecologies scalars, Finegold's HSE work was developing a theory of multiple factor interactions that was progressing beyond metaphorical usage. These two important post-metaphorical approaches – spatial ecological scalars and dynamic system factors - were combined by Hodgson and Spours (2013; 2015) to develop the analysis of a 'Low Opportunity Progression Equilibrium' (LOPE) and the model of a 'High Opportunity Progression Ecosystem' (HOPE) in relation to the development of further education and VET in England.

Several years later, in the movement from SEM 1.0 to 2.0, Finegold's high skill inter-dependent elements were distributed along the key dimensions of the 45-degree change model – collaborative horizontalities, facilitating verticalities and 45-degree mediation (see Figure 2).

3. Critiques of 'elite entrepreneurial ecosystems' – towards an inclusive Social Ecosystem Model

The rise of Big Tech the early 2000s and the subsequent birth of the so-called Fourth Industrial Revolution (Schwab, 2018), we can appreciate how Finegold's HSE analysis provided an explanation of the conditions that gave rise to clusters of high growth companies (e.g., Google, Apple, Facebook, Amazon and Uber) that developed into what is now termed 'Platform Capitalism' (Morozov 2015; Srnicek 2016). Reflections on the growth of US Tech Giants and their contribution to an exploitative 'Surveillance Capitalism' (Zuboff, 2019), suggested that human ecosystems were not necessarily an unconditional good.

The passage of time has revealed that the entrepreneurial ecosystem model, with its combination of finance and high tech (FinTech) and fed by a steady stream of university educated graduates, has

resulted in an exclusionary working, living and learning dynamic (Maleki, 2011; Mason and Brown, 2013). Interestingly, entrepreneurial ecosystem literatures do not cite Finegold although his HSEs in Silicon Valley appear, nevertheless, to be an early example of the FinTech conception on a regional scale. A critique of the elite entrepreneurial ecosystem model stimulated imaginings of an alternative inclusive SEM 1.0 with key roles for further education and local government (Hodgson and Spours, 2018). Apart from the exclusion/inclusion distinction, there were also important methodological differences. While the elite entrepreneurial ecosystem approach reflected ‘retrospectively’ on existing and historical phenomenon of FinTech to interpret entrepreneurial ecosystem development dynamics, the inclusive SEM would need to deploy theory ‘prospectively’ as a guide to future inclusive social ecosystem construction.

Extending the Skills Ecosystems approach

The elite-inclusive ecosystem comparative exercise led to critical reflections on the Finegold HSE model and the Skills Ecosystems approach that drew heavily on his work. The concept of Skills Ecosystems has, over the past two decades, captured the imagination of academics and policymakers in relation to skills formation and economic innovation in Anglo-Saxon type economies (e.g., Australia, UK and US), with key ideas of the life sciences to capture a holistic approach to skills utilization and its development in companies with links to the VET system (Buchanan, 2006; Hall & Lansbury 2006; Payne, 2007). This approach, that critiqued the ‘skills supply’ orthodoxy that underplayed the significance of employer demand for skills (Keep, 2018), also evolved beyond Finegold’s original HSE work with its focus on high-skill environments to recognize more diverse economies (high, medium and foundational) with their differing skills requirements (Buchanan et al., 2017).

Nevertheless, the passage of time has laid bare limitations. The most significant proved to be the confinement of Australian skills ecosystem pilots to private sector companies in which owners and managers elected for less progressive routes to business viability (Buchanan et al., 2017). At the same time, the focus on the private sector under-estimated the role of the public realm and the role of the national and local state in develop skills ecosystems in less favourable economic environments than those of Silicon Valley (Hodgson and Spours, 2016; 2018).

There were also conceptual limitations. The skills ecosystem approach continued to utilize the ‘analogous metaphorical device’, focusing on Finegold’s four ecosystem elements to examine how far these existed in specific skills contexts (Buchanan et al., 2017). Metaphorical usage thus lapsed into empiricism. This non-theoretical ecosystem thinking proved less capable of considering the wider

economic and political system conditions required for its future effectiveness. In response, the Social Ecosystem Model would seek to extend the Skills Ecosystem approach by including a 'living' dimension and highlighting a more proactive role for the local and national state.

Part 4. SEM 1.0 - Working, Living, Learning in place-based VET

Introducing 'Living' into the skills equation

The limitations the Skills Ecosystem approach revealed the challenges facing SEM 1.0 - notably the need to extend the conceptual boundaries of the Skills Ecosystem approach with the introduction of a more explicit political economy analysis by conceiving wider public-private-third sector partnerships rather than a dependency on the private company. Additionally, in the context of research on skills development in the UK's East London, the focus broadened to recognize the importance of housing and journeys to work in global cities. This broader environmental concern led to the formation of the 'Working Living, Learning Nexus' (Hodgson & Spours, 2018).

'Working' - Productive activities, as in the Skills Ecosystem approach, could include building working partnerships between employers, education and training providers and local government to produce a more high-skilled and inclusive local economy, while assisting localities to transition towards net zero (Spours & Grainger, 2023). An integral part of the new working partnership dimension would be local co-production projects between workplaces, education providers and civic society organisations to stimulate the development of new high-value jobs and to improve skill utilisation at work (Keep, 2018). This includes attracting high-value companies in cultural or digital industries, developing ecological enterprises as part of a greening economy, and improving public infrastructure and services like transport, healthcare, and construction (Smith et al., 2024). Seen this way, the skills ecosystems approach operates fundamentally along the working dimension of the SEM in the 'middle range' exosystem level.

Living' - It has become increasingly clear that the ways people live their lives and undertake work are intimately linked (Hodgson & Spours, 2019). Linkages include an increasing focus the development of affordable housing; investing in local transport systems to reduce the impact of the 'journey to work'; regeneration of the UK's declining high streets and town centres; improved local health services and the creation of new green and blue spaces, all of which help support a strong local identity [Power to Change, 2024]. The perceived relationship between living and working factors now is developing in differing ways. It has been shown, for example, that high streets and the centres of small towns in the UK become more sustainable when connected with employment taking place in the vicinity (Bromley,

2005; Rushby, 2018). Recently, the 'Working, Living and Learning Nexus' has found expression in policies promoting '20-Minute Cities' (Calafiore et al., 2022) that spatially connect these three dimensions of human development.

'Learning' - The learning dimension of the SEM is not only focused on the educational development of the learner throughout the life course, but also on supporting the participation of local people in the new local economy and wider civic life. Here, there are challenges of creating not only high-skilled jobs, but also better-quality employment at lower levels, termed the 'foundational economy' (Foundational Economy Collective, 2018). At the same time, the living dimension adds to the educative mission by suggesting the need to create city-based life-long learning systems (Fitzpayne & Neumann, 2020) that can enable local people to participate in working life and education throughout the life course (Trudeau & Kruse, 2014) and grasp the opportunity to lead more purposeful and sustainable lives, understood as building for and participation in a Good Society (Lawson & Spours, 2011, Goss, 2020; 2023).

Inclusive growth, combinational VET and expanded skills ecosystems

The SEM 1.0 framework emphasizes inclusive economic growth by focusing not only on the rate of local growth but also on its social distribution (Metro Dynamics, 2018). A commitment to inclusive economic growth means recognizing that a 'combinational' local or regional economy, which includes a range of high- and low-skill productive tasks, will also require 'combinational VET' to help close regional class gaps (Stansbury et al., 2023). Combinational VET refers to a focus on intermediate and foundational skills for a range of technical and operational jobs, as well as on the skills for graduate jobs (Spours & Grainger, 2023). This expanded focus requires educational and workplace collaboration across the private, public, and third sectors, perceived as 'actor networks' and 'learning ecosystems' (Virolainen & Heikkinen, 2018).

Unlike elite entrepreneurial ecosystems that have relied on outputs from prestigious universities, the comprehensive SEM aims to involve local populations in learning, accessing better work, and achieving sustainable living through lifelong learning provision. This process, also referred to as 'skills escalators' (Colechin et al., 2017), is designed to facilitate personal progression through education, the transition to work, and within working life itself. Further education colleges are key to this type of economic, social, and educational inclusion due to their commitment to skill development and progression (Doel, 2018). However, fulfilling this collaborative, place-based mission requires a shift from a competitive to a collaborative mindset among further education institutions in the marketized English further education context (Hodgson, 2015).

Part 5. Social Ecosystem Model 2.0

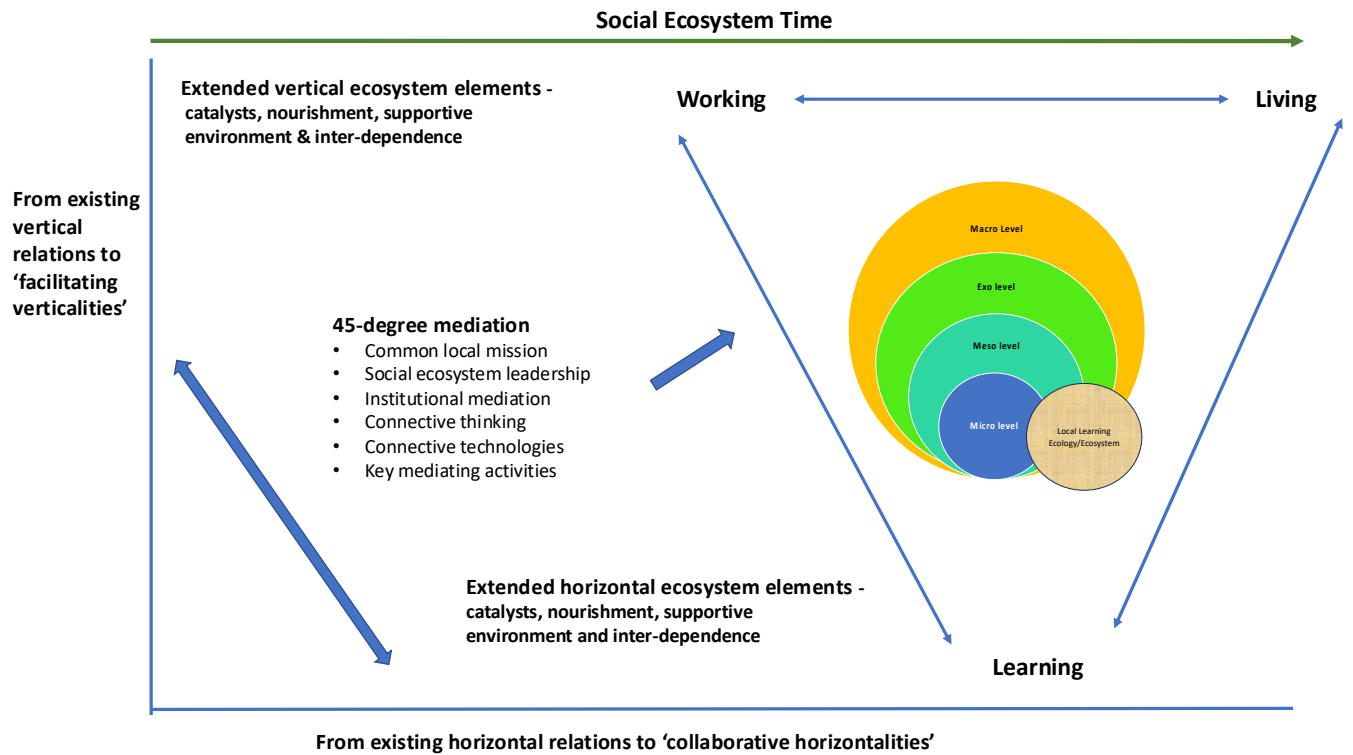
Network idealism and the 45-degree change model

The road to SEM 2.0 was built not only on the theoretical features of SEM 1.0 (i.e. adaptations of Bronfenbrenner and Finegold), but also through critical reflections on its network features. While the use of the ecologies/ecosystem metaphor is sometimes contextualized in wider settings (e.g. Jackson & Barnett, 2020), an analysis of its differing interpretations suggests that the metaphor exists principally as a network concept. While network concepts emphasise connective thinking and collaboration, they often underplay the role of external forces (Bell & Hindmoor, 2009), leading to what has been termed ‘network idealism’ that can depoliticize the situation being represented (Welsh, 2014). Put another way, network conceptions tend to lack recognition of the role the State and the exercise of power (Davies, 2011), resulting in overestimations of what can be achieved on the horizontal terrains of civil society in the absence of reform of the vertical governmental state.

The strategic absence in SEM 1.0 was addressed by introducing a ‘45° change model’ (Lawson, 2019), which Spours (2023) adapted to include four related dimensions: 1. Collaborative Civil Society Horizontalities; 2. Facilitating State Verticalities; 3. 45-Degree Mediation; and 4. Social Ecosystem Time. This model provided a structure for an emergent ‘political economy ecosystem framework’ to embrace the Working, Living, and Learning dynamic of SEM 1.0 (see Figure 2). The enhanced framework is reflected in an expanded definition of SEM 2.0 and illustrated in Figure 2.

A social ecosystem is conceived as an evolving, dynamic place-based social formation that connects the worlds of Working, Living, and Learning with the purpose of nurturing inclusive, sustainable economic, social, and educational development in diverse communities, localities, and sub-regions. The Social Ecosystem Model (SEM) is currently conceptualized as a multi-level spatial system (micro-macro) operating within a wider 45-degree political economy framework that consists of four related dimensions: 1. Collaborative Horizontalities (e.g., education networks, local anchor institutions, a range of social partners/communities supported by the connective role of digital technologies); 2. Facilitating Verticalities (an enabling national state and empowered local state); 3. 45-degree politics and mediation through common mission, facilitating structures, and ecosystem leadership; and 4. Ecological time that allows for processes of holistic and deliberative social ecosystem evolution.

Figure 2. Full SEM 2.0 political economy, ecology framework



Reflections on the four dimensions of SEM 2.0

The SEM, while elaborated, is still very much emergent and requiring of continuous critical reflection (Ramsarup et al., 2022). The following section elaborates the key dimensions of SEM 2.0 illustrated in Figure 2, subsequent methodological issues concerning the incorporation of the seminal works of Bronfenbrenner and Finegold and concluding with several reflective questions on the emergent political economy, ecology framework.

Dimension 1. 'Collaborative civil society horizontalities' — while combining both vertical and horizontal forces, social ecosystems arguably work optimally when the horizontal dimension is dominant and in which an open civil society terrain encourages collaborative social activity and innovation. Developing the terrain of civil society horizontalities, social ecosystems comprise those factors and forces that are mainly local in nature, including networks, local civic anchor institutions, workplaces, communities and place-based digital technologies operating in a collaborative way (Spours, 2024b). The 'area' or 'local place' is seen as a setting for economic, civic and educational development in which participatory networks (Stringer et al., 2006) are supplemented by local institution-building. Referred

to as ‘anchor institutions’, relevant education governance literatures have paid particular attention to the local role of universities in supporting place-based developments (Birch et al., 2003; Harris & Holley, 2016). However, civic anchor institutions can be defined more broadly as organisations that, alongside their primary function, play a developmental role in by employing local people, leveraging local investment, boosting regeneration and supporting a sense of local identity (Smallbone et al., 2015). These could include large employers in the private sector and public organisations such as the NHS. In the world of learning beyond universities, civic anchor institutions would include community-based schools, further education colleges and adult learning institutes that ‘nourish’ (Finegold, 1999) the local social ecosystem.

Dimension 2. ‘Facilitating state verticalities’—comprise national state structure and policies that, in the neoliberal era, have exercised significant negative effects on local government, education institutions and communities through an array of coercive devices such as funding levers, accountability regimes and global performative measurement in the form of PISA (Coffield et al., 2008).

It is possible, however, for vertical factors and forces to develop a facilitating role to encourage economic, political and cultural developments across state and civil society (Spours, 2023). In the economic sphere, a progressive role could be represented by what has been referred to as the ‘entrepreneurial state’ to lead strategic investment and risk taking in shaping private markets (Mazzucato, 2011). In addition, in the political sphere, a facilitating state could also seek to empower local governments and citizens by devolving important powers to the local level through ‘democratic localism’ to rebalance national, regional and local relations (Gaventa, 2004; Hodgson & Spours, 2012]. In terms of education, devolutionary strategies could see curriculum and assessment being more professionally and locally shaped rather than being imposed from above (Exley & Ball, 2014).

Dimension 3: Forty-five-degree mediation - in the context of the UK's adverse economic and social conditions, an expanded SEM must be brought into existence through what Lawson (2019) refers to as ‘45-degree politics,’ which connect the horizontal and vertical worlds of civil society and the governmental state. This connectivity, in terms of SEM 2.0, is conceptualized as the process of ‘mediation’ (Spours, 2023) that, at its most essential, involves acting on and reforming ‘verticalities’ – national governmental state and global relations – and organising and mobilising ‘horizontalities’ across civil society. In terms of Gramscian political economy analysis, mediation can be seen as a springboard to shift forward political equilibria (Boothman, 2017).

In these processes, public or ‘organic’ intellectuals (Gramsci, 1971 translation), reimagined for the 21st century (Rojas-Bahamón, 2021), can play a leading role. Mediating actors include civic-minded and publicly committed professionals from education, local government, workplaces, and various civil society organizations, including trade unions and activists (Alexandrou, 2010). Mediation is understandably a demanding activity, requiring advanced capabilities such as a deep knowledge of local complexities and key challenges and a shared sense of mission among various social partners and their specialisms (Mazzucato, 2016). Accordingly, social ecosystem leadership in learning and skills could combine the benefits of diverse perspectives with a common focus on lifelong learning, sustainable living, and inclusive economic growth (Hodgson & Spours, 2018). Socialized digital technologies may also play a crucial connective role, enabling the networked locality to involve citizens as co-designers, co-producers, and co-learners (Bollier, 2016).

Seen within the overall 45-degree change model - mediation can be conceptualized as an assemblage of connective ideas, practices, structures and technologies - that are brought into a synergistic relationship within what has been termed the ‘45-degree zone’ (see Figure 2). This assemblage includes:

- *Mediating mission* – a shared and unifying narrative to connect an array of horizontally and vertically organized factors and forces.
- *Mediating actors* – leadership role of organic intellectuals in the public and private spheres in creating terrains (levels or scalars of the social ecosystem) and aligning them into a reciprocal relationship.
- *Mediating organisations* - collective and institutional leadership and governance - civic anchor institutions, local government and political parties – that straddle the horizontal and the vertical.
- *Mediating materiality* – provision of resources to sustain the development of the social ecosystem.
- *Mediating technologies* – role of socially assistive artificial intelligence and machine learning ¹.
- *Mediating thinking* – the ‘Organic Intellect’ (Spours, 2026) – connective thinking that combines progressive horizontal thought (understood as the socialized General Intellect) and progressive vertical expertise (Connective Specialisation) ².
- *Key mediating activities* – political mediation of vertical factors and forces (to become ‘facilitating verticalities’) and the organizing/connecting of disparate horizontal factors and forces (to become ‘collaborative horizontalities’).

¹ The idea of a ‘progressive model of artificial intelligence’ will also be the focus of a 2025 publication.

² Conceptions of ‘progressive mediation’ and the ‘organic intellect’ will be explored further in an upcoming paper on 45-change 2.0.

With multiple mediation elements it is possible to consider weak and strong versions. For instance, weak mediation might involve individuals attempting system improvements without the support of other enabling factors. Conversely, a synergistic relationship between several elements can lead to stronger mediation possibilities. Therefore, creating a social ecosystem dynamic among the different elements of mediation should be a primary aim. However, the effectiveness of mediating 'difficult verticalities' that hinder social ecosystem development will depend on progressive shifts in broader politics to provide these affordances (Spours, 2023).

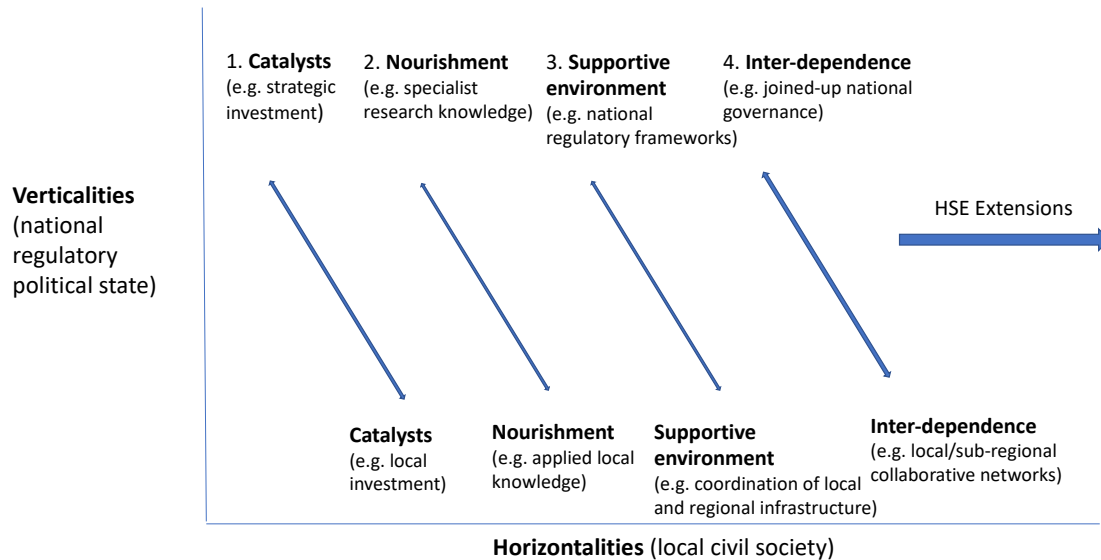
Dimension 4: Social Ecosystem Time – social and natural ecosystems exhibit different concepts of time and development. Natural ecosystems are considered 'time-bound' due to their degeneration/regeneration cycles (Mason & Harrison 2006; Hahn & Tampe, 2021). In contrast, human ecological systems do not follow these cycles. Instead, the 'chronosystem' accounts for changes over a lifespan, influencing personal development, including major life transitions and historical events (Guy-Evans, 2020).

Dimension 4 in the SEM extends this principle of open evolutionary development by linking individual human development patterns over the life course with the evolution of socio-political frameworks and their diverse social ecosystems. At its most ambitious, Dimension 4 envisions 'social ecosystem time' as the totality of relations within the broader political economy framework. This concept represents a long-term project aimed at the sustainable expansion of learning and knowledge production (Spours, 2024b).

Methodological issues in the expanded SEM

The incorporation of the work of Bronfenbrenner and Finegold - the introduction of the 45° change model required a further adaptation of the work of Bronfenbrenner and Finegold considering their continued importance. As Figure 2 illustrates, the spatial adaptation of Bronfenbrenner' multilevel ecological system was embedded within the 45-degree zone of mediation, reflecting the aim utilising its connective qualities. On the other hand, Finegold's four ecosystem elements were distributed to the horizontal and vertical axes of the expanded framework, contributing to an extended skills ecosystem approach (see Figure 3).

Figure 3. Extending Finegold's HSEs within the 45-degree framework



This distribution amplified the role of ‘collaborative horizontalities,’ where ‘inter-dependent relations’ and ‘nourishment’ now focused on a wider range of collaborative horizontal factors and forces to support diverse skills development in local and regional economies (Grainger & Spours, 2018).

Simultaneously, it was recognized that ‘network-building’ needed to progress to ‘institution-building’ because the future stability of the SEM would depend on more permanent, progressive institutional formations. This can be understood as ‘the long march through institutions’ (Dutschke, 1967) or a ‘War of Position’ (Gramsci, 1971), which involves both the mobilization of horizontal civil society and the reform of the vertical state in the 45-degree zone of mediation. As part of this, Finegold’s ‘Catalysts’ and a ‘Supportive Environment’ were extended by proposing a more comprehensive role for the State, including forms of public risk-taking in areas where the private sector is often reluctant to tread (Mazzucato, 2011).

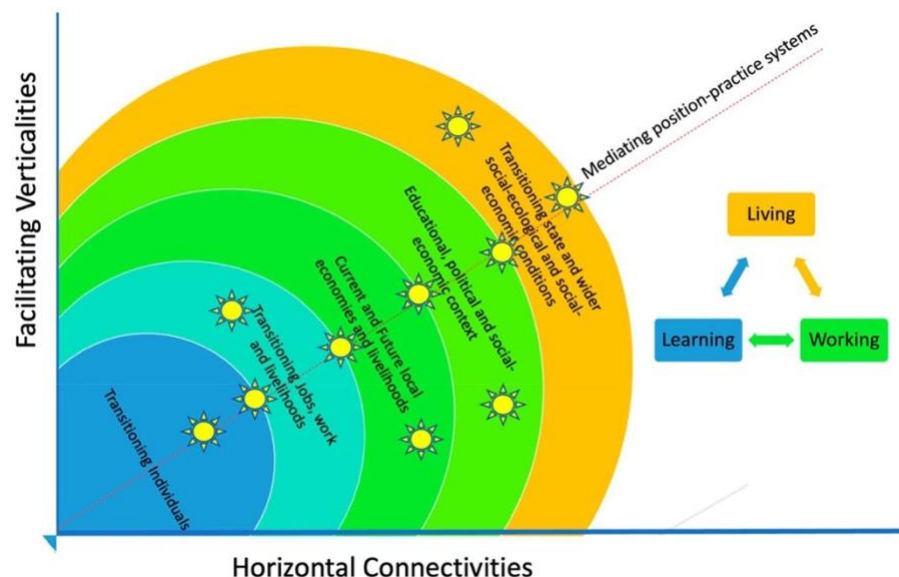
Reflective questions on an emergent framework – at this relatively early stage of the development of SEM 2.0, South African colleagues rightly insisted that the framework should be subjected to critical questioning, particularly related to evaluative criteria concerning the realization of the expanded model in both the contexts of the Global North and South. The following questions, interrogating the four SEM 2.0 dimensions, were initially formulated at the Witwatersrand Skills Ecosystem Workshop in November 2023 and now represented in the axes of Figure 2.

1. What is the balance of imposed or facilitating actions of verticalities in relation to the current context?
2. How organized or disorganized are civil society horizontalities in the current context?
3. How many mediating forces are present, and how aligned are they in relation to the balance of vertical and horizontal forces and factors?
4. How far are progressive mediating forces in agreement on social ecosystem time for transitioning?

Part 5. SEM 2.0 - societal and sustainability transitioning

The most recent phase has seen the expanded SEM being linked to concepts of ‘societal transitions’ and particularly the ‘Just Transition’ (Ramsarup et al., 2019; Spours & Grainger, 2023). This final section attempts to foreground the concepts of sustainability and Just Transitions. To assist with this process, the first concern is the critique of the current SEM, notably its lack of ‘groundedness’ and the need to recognize the emergent and contingent nature of the model (Ramsarup et al. 2022). The second concern is the further expansion of the model to meet the requirements of multiple transitions. Figure 4 represents the expanded skills ecosystem concept of members of the Africa VET 4.0 Collective.

Figure 4. Multiple transitions across work and societal contexts



Source: Ramsarup, Lotz-Sisitka, and McGrath (2022)

While Ramsarup and colleagues have appreciated the potential role of the SEM in expanding the skills ecosystem approach, particularly through the inclusion of the Living dimension that resonates in the

South African context, they argue that it has *'an inadequately differentiated theory of emergence'* (2022: 572) and proceed to suggest a process of *'laminated ontological grounding' arising from reviews of multiple research stories and national cases'* (Lotz-Sisitka et al., 2021). This research-based procedure gives rise to a 'political economy ecology' perspective of nested relations of potential emergence (578) reflecting a:

'strong emphasis on the intersection of social and environmental concerns and the immanent confluence of political-economy-ecology relations that are shaping VET within the wider laminated totality'. This operates as a 'functioning social-ecological ecosystem model for skills... reflecting current demands for giving greater attention to the transitioning experiences of learners, changing jobs, livelihoods and work, institutional, and political-economy-ecology or environmental concerns in skills system development' (583).

A virtue of this perspective is that it brings helps to ground social ecosystem model building in differing realities. Interestingly, the final phases of SEM development in the English context (2018 onwards) were without the influence of practical research projects. One answer to this theory-practice dilemma is to organize research into the totality of existing VET realities in multiple contexts to understand how vocational learning might be reformed in a sustainable and human-centred direction. SEM development, therefore, needs to become a more shared enterprise to help move from an emergent to a more mature and grounded stage.

References

- Alexandrou, A. (2010) Gramsci, Embryonic Organic Intellectuals, and Scottish Teacher Learning Representatives: Alternatives to Neoliberal Approaches to Professional Development in the K-12 Sector. *Workplace*, 17, 75–95.
- Andersson, E., Borgström, S., Haase, D., Langemeyer, J., Mascarenhas, A., McPhearson, T., Wolff, M., Łaskiewicz, E., Kronenberg, J., Barton, D. N., & Herreros-Cantis, P. (2021). A context-sensitive systems approach for understanding and enabling ecosystem service realization in cities. *Ecology and Society*, 26(2), 35. DO - 10.5751/ES-12411-260235.
- Barnett, R. (2010). *Towards an ecological professionalism*, paper presented to the European Conference of Education Research (ECER), Helsinki, September.
- Barnett, R. & Jackson, N. (2020) *Ecologies for Learning and Practice: Emerging Ideas, Sightings and Possibilities*, London: Routledge.
- Birch, E.; Perry, D.; Taylor, H. (2003) Universities as Anchor Institutions. *J. High. Educ. Outreach Engagem*, 17, 7.
- Bollier, D. (2000). *Ecologies of Innovation: The Role of Information and Communications Technologies*. A Report of the Eighth Annual Aspen Institute, Roundtable on Information Technology (<http://www.aspeninstitute.org/atf/cf/%7BDEB6F227-659B-4EC8-8F84-8DF23CA704F5%7D/C&SECOINNOV.PDF>) Accessed 11 April 2016.
- Bollier, D. (2016). *City as Platform: How digital networks are changing local life and governance*. The Aspen Institute, Washington DC. <https://www.aspeninstitute.org/publications/the-city-as-a-platform-how-digital-networks-are-changing-urban-life-and-governance/> accessed 31 January, 2018.
- Boothman, D. (2017). *Gramsci's Historical Bloc: Structure, Hegemony and Dialectical Interactions*. movimento-revista de educação. 131. 10.22409/movimento2017.v0i6.a20928.
- Brenner, N., & Theodore, N. (2002). Cities and the Geographies of “Actually Existing Neoliberalism”. *Antipode*, 34(3), 349-379.
- Bromley, R. D. F., Tallon, A. R., & Thomas, C. J. (2005). City Centre regeneration through residential development: contributing to sustainability. *Urban Studies*, 42(13), 2407-2429.
- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*, Cambridge, MA: Harvard University Press.
- Buchanan, J. (2006). *From 'Skill Shortages' to Decent Work: The Role of Better Skill Ecosystems*. Sydney: NSW Department of Education and Training.
- Buchanan, J. Anderson, P. and Power, G. (2017). in J. Buchanan, D. Finegold, K. Mayhew and C. Warhurst (eds) 'Skill Ecosystem' *The Oxford Handbook of Skills and Training* Oxford Handbooks Online.
- Calafiore, A. Dunning R., Nurse, A. & Singleton, A. (2022). 'The 20-minute city: An equity analysis of

Liverpool City Region', *Transportation Research Part D: Transport and Environment*, Volume 102, 103111.

Casasanto, D. (2014). 'Development of metaphorical thinking: The role of language' in M. Borkent, J. Hinnell, and B. Dancygier (eds) *Language and the Creative Mind* California: Stanford Publications.

Chapin, F.S. III, Carpenter, S.R., Kofinas, G.P., Folke, C., Abel, N., Clark, W.C., Olsson, P., Stafford Smith, D.M., Walker, B., Young, O.R., Berkes, F., Biggs, R., Grove, J.M., Naylor, R.L., Pinkerton, E., Steffen, W. and Swanson, F.J. (2010). *Ecosystem Stewardship: Sustainability Strategies for a Rapidly Changing Planet*. *Trends in Ecology & Evolution*, 25(4), pp. 241-249. DOI: 10.1016/j.tree.2009.10.008.

Coffield, F., Edward, S., Finlay, I., Hodgson, A., Steer, R. and Spours, K. (2008). *Improving Learning, Skills and Inclusion: The impact of policy*. London: Routledge Falmer.

Colechin, J., Murphy, H., Stevens, C., Penacchia, J., Ray, K., and Vaid, L. (2017). *Evaluation of the Skills Escalator Pilot* Leicester: Learning and Work Institute.

Davic, R. D. (2003). Linking Keystone Species and Functional Groups: A New Operational Definition of the Keystone Species Concept. *Conservation Ecology*, 7(1). <http://www.jstor.org/stable/26271938>

Davies, J. S. (2011). *Challenging Governance Theory: From Networks to Hegemony*. Bristol: Policy Press.

Dutschke, R. (1967) *Der lange Marsch durch die Institutionen*. Berlin: Verlag Klaus Wagenbach.

Diamond, P. (2015). New Labour, politicisation and depoliticisation: The delivery agenda in public services 1997–2007. *Br Polit* 10, 429–453. <https://doi.org/10.1057/bp.2015.10>.

Doel, M. (2018). *Defining Further Education: Does it Matter?* Inaugural Professorial Lecture, UCL Institute of Education, 15 February.

Exley, S. and Ball, S.J. (2014) 'Neo-liberalism and English education', in Ball, S.J. (ed.) *The Education Debate*. 2nd edn. Bristol: Policy Press, pp. 77-94. Available at: Policy Press (Accessed: 2 January 2025).

Finegold, D. (1999). 'Creating self-sustaining, high-skill ecosystems', *Oxford Review of Economic Policy*, 15, (1) 60-81.

Finegold, D. and Soskice, D. (1988). The failure of training in Britain: analysis and prescription, *Oxford Review of Economic Policy*, 15 3, 21-53.

Fitzpayne, A. & Neumann, Z. (2020). *Building a Lifelong Learning System: A Roadmap for Cities*, Aspen Institute - <https://www.aspeninstitute.org/publications/building-a-lifelong-learning-system/> - accessed 1 January, 2025.

Folke, C., Hahn, T., Olsson, P. and Norberg, J. (2005). *Adaptive Governance of Social-Ecological Systems* Annual Review of Environment and Resources Vol. 30: 441-473.

- Gaventa, J. (2004) *Representation, Community Leadership and Participation: Citizen Involvement in Neighbourhood Renewal and Local Governance*. Institute of Development Studies. Available at: [GOV.UK](https://www.gov.uk) (Accessed: 2 January 2025).
- Goss, S. (2020). *Garden Mind: An Eco-System View of Change and a Different Role for the State*. Compass publications - <https://www.compassonline.org.uk/publications/garden-mind/> - accessed 1 January, 2025.
- Goss, S. (2023). *The New Settlement: For a Better Society* Compass publications - <https://www.compassonline.org.uk/publications/the-new-settlement-for-a-better-society/> - accessed 1 January 2025).
- Grainger, P. and Spours, K. (2018). *A Social Ecosystem Model: A New Paradigm for Skills Development? Future of Work and Education for the Digital Age*, T20 Argentina.
- Gramsci, A. (1971 Translation). *Selections from the Prison Notebooks* London: Lawrence and Wishart.
- Grote, J. R. (2012). "Horizontalism, Vertical Integration and Vertices in Governance Networks. *Stato e mercato* 32 (1): pp. 103-34.
- Guy-Evans, O. (2020) Bronfenbrenner's Ecological Systems Theory. 2020. Available online: <https://www.simplypsychology.org/Bronfenbrenner.html> (accessed on 23 October 2022).
- Hahn, T. & Tampe, M. (2021) Strategies for regenerative business. *Strateg. Organ.*, 19, 456–477. <https://doi.org/10.1177/1476127020979228>.
- Hajer, M. and Wagenaar, H. (eds) (2003.) *Deliberative Policy Analysis: understanding governance in the network society*. Cambridge: Cambridge University Press.
- Hall, R. & Lansbury, R. (2006). Skills in Australia: towards workforce development and sustainable skill ecosystems, *Journal of Industrial Relations*, 48, 5, 575-592.
- Harris, M.; & Holley, K. (2016). Universities as Anchor Institutions: Economic Social Potential for Urban Development. In *Higher Education: Handbook of Theory and Research*; Paulsen, M., Ed.; M.B. Paulsen (ed.), Higher Education: Handbook of Theory and Research, Higher Education: Handbook of Theory and Research 31, DOI 10.1007/978-3-319-26829-3_8,
- Hartmann, A. (2024). *Fundamentals of Ecology for Sustainable Ecosystems*. Harvard Extension School. Available at: <https://coursebrowser.dce.harvard.edu/course/fundamentals-of-ecology-for-sustainable-ecosystems/>.
- Hecht, M. & Crowley, K. (2020). Unpacking the Learning Ecosystems Framework: Lessons from the Adaptive Management of Biological Ecosystems. *J. Learn. Sci*, 29, 264–284.
- Herzog, S. (2007). The ecology of learning: The impact of classroom features and utilization on student academic success. *New Dir. Institutional Res*, 135, 81–106. <https://doi.org/10.1002/ir.224>.
- Hodgson, A. (2015). *The Coming of Age for FE? Reflections on the past and future role of further education colleges in the UK*. London: UCL Institute of Education Press. ISBN 978-1-78277-123-4.

- Hodgson, A. and Spours, K. (2009). *Collaborative Local Learning Ecologies: Reflections on the Governance of Lifelong Learning in England* IFL Sector Paper 6, Leicester: NIACE.
- Hodgson, A. and Spours, K. (2012). Three versions of 'localism': implications for upper secondary education and lifelong learning in the UK. *Journal of Education Policy*, 39, 2, 193-210.
- Hodgson, A. & Spours, K. (2013). 'Tackling the Crisis Facing Young. People: Building 'High Opportunity Progression Eco-Systems' *Oxford Review of Education*, 39, 2, 211-228.
- Hodgson, A. & Spours, K. (2015). An ecological analysis of the dynamics of localities: a 14+ low opportunity progression equilibrium in action' *Journal of Education and Work*, 28, 1, 24-43.
- Hodgson, A. and Spours, K. (2016). *The evolution of social ecosystem thinking: its relevance for education, economic development and localities: A stimulus paper*, Centre for Post-14 Education and Work, UCL Institute of Education.
- Hodgson, A. and Spours, K. (2018). *A social ecosystem model: conceptualizing and connecting working, living and learning in London's New East*. Available at: <https://elvetlondon.co.uk/protected/resources.php>, accessed 18 September 2018.
- Homer-Dixon, L.; Janzwood, S.; Rockstöm, J.; Renn, O.; Donges, J. (2024). Global Polycrisis: The Causal Mechanisms of Crisis Entanglement. *Glob. Sustain.*, 7, e6. <https://doi.org/10.1017/sus.2024.1>.
- Jessop, R. (2014). Liberalism, Neoliberalism and Urban Governance. A State Theoretical Perspective - <https://bobjessop.org/2014/12/02/liberalism-neoliberalism-and-urban-governance-a-state-theoretical-perspective/> - accessed 1 January 2025.
- Keep, E. (2015). 'Governance in English VET: On the functioning of a fractured 'system'', *Research in Comparative and International Education*. DOI: <http://doi.org/10.1177/1745499915612185>
- Keep, E. (2018). The Long-Term Implications of Devolution and Localism for FE in England. *Journal of Further and Higher Education*, 42(2), 131-144.
- Lakoff, G., & Johnson, M. (1980). *Metaphors We Live By*. University of Chicago Press.
- Lawson, N. (2019). *45-Degree Change: Transforming Society from below and above* London: Compass publications.
- Lawson, N. & Spours, K. (2011). *Education for the Good Society. The values and principles of a new comprehensive vision*. London: Compass Publications.
- Lotz-Sisitka, H., V. Pesanayi, L. Sisitka, L. Metelerkamp, G. Chakona, W. van Staden, C. Matambo, et al. (2021). "'Amanzi for Food": A Social Learning Approach to Agricultural Water Knowledge Mediation, Uptake and use in Smallholder Farming Learning Networks', Research and Development Report No. TT 868/21, Water Research Commission, Pretoria.
- Malecki E J. (2011). Connecting local entrepreneurial ecosystems to global innovation networks: open innovation, double networks and knowledge integration, *International Journal of Entrepreneurship and Innovation Management*, 14, 36-59.

- Mason, C. & Harrison, R. (2006). After the exit: Acquisitions, entrepreneurial recycling, *Regional Studies*, 40, 55 – 73.
- Mason, C. & Brown, R. (2013). *Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship* Paris: OECD.
- Mazzucato, M. (2011). *The Entrepreneurial State*, London: Demos.
- Mazzucato, M. (2016). From market fixing to market-creating: a new framework for innovation policy *Industry and Innovation* 23 (2) <https://doi.org/10.1080/13662716.2016.1146124>
- Metro Dynamics (2018). *Growth Commission Stocktake: Towards Inclusive Growth for Barking and Dagenham* London: Metro Dynamics
- Morozov, E. (2019). It's not enough to break up Big Tech. We need to imagine a better alternative *The Guardian*, 11 May.
- Nardi, B.A. & O'Day, V.L. (1999). *Information ecologies: using technologies with heart* Cambridge: MIT Press.
- Newman, J. (2014). Landscapes of antagonism: Local governance, neoliberalism and austerity. *Urban Studies*, 51(15), 3290–3305. <http://www.jstor.org/stable/26145963>
- Ostrom, L. A (2009). General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325, 419–422.
- Park, R.E. & Burgess, E.W. (1924). *Introduction to the Science of Sociology*; University of Chicago Press: Chicago, IL, USA; Volume 1.
- Payne, J. (2007). *Skills in context: what can the UK learn from Australia's skill ecosystem projects?* SKOPE Research Paper No 70. SKOPE: University of Oxford.
- Pollitt, C. (2008). *Institutional Amnesia: A Paradox of the 'Information Age'?* Prometheus, 18(1), 5-16. DOI: 10.1080/08109020050000627.
- Ramsarup, P. & Rousson, J. (2023). 'Towards an Expanded Notion of Skills Ecosystems in VET' in VET Africa 4.0 Collective (eds) *Transitioning Vocational Education and Training in Africa. A Social Skills Ecosystem Perspective*, Bristol: Bristol University Press.
- Ramsarup, P., Lotz-Sisitka, H & McGrath, S. (2022). A laminated, emergentist view of skills ecosystems, *Journal of Critical Realism*, 21:5, 571-588, DOI: [10.1080/14767430.2022.2145768](https://doi.org/10.1080/14767430.2022.2145768).
- Ramaswami, A., Russell, A. G., Culligan, P. J., Sharma, K. R., & Kumar, E. (2016). Meta-principles for developing smart, sustainable, and healthy cities. *Science*, 352(6288), 940-943.
- Rettig, J. (2009). School libraries and the educational ecosystem. *Change Mag. High. Learn.*, 41, 28–29. <https://doi.org/10.3200/CHNG.41.2.28-29>.
- Rojas-Bahamón, M.J. (2021) 'Rethinking the Category of Organic Intellectual of/by Antonio Gramsci in Today's World', *Cuestiones Políticas*, 39(70), pp. 1-15. Available at: Cuestiones Políticas (Accessed: 2 January 2025).

- Rosa, E. M., & Tudge, J. (2013). Urie Bronfenbrenner's Theory of Human Development: Its Evolution from Ecology to Bioecology. *Journal of Family Theory & Review*, 5(4), 243-258.
- Rosenberg, E. & Ramsarup, P. (2019) 'Skills for Just Transitions to Sustainability. an Orientation' in E. Rosenberg, P. Ramsarup, & H. Lotz-Sisitka (eds) *Green Skills Research in South Africa – Models, Cases and Methods* - <https://doi.org/10.4324/9780429279362>, London: Taylor Francis.
- Rushby, K. (2018). How to bring a high street back from the dead *The Guardian* 29 March.
- Sahlberg, P. (2012) *Global Educational Reform Movement is here!*
<https://pasisahlberg.com/global-educational-reform-movement-is-here/>
- Saiz, A. (2005). Globalisation, Cosmopolitanism and Ecological Citizenship. *Environ. Politics* 14, 163–178.
- Sambell, K., Brown, S., & Graham, L. (2017). *Professionalism in Practice: Key Directions in Higher Education Learning, Teaching and Assessment*. Springer.
- Sangrà, A.; Raffaghelli, J., & Catusus, M. (2019). Learning ecologies through a lens: Ontological, methodological and applicative issues. A systematic review of the literature. *Br. J. Educ. Technol.*, 50, 1619–1638.
- Siemens, G. (2008). New structures and spaces of learning: The systemic impact of connective knowledge, connectivism, and networked learning. In *Encontro sobre Web 2.0. Braga*; Universidade do Minho, Braga, Portugal.
- Smallbone, D.; Kitching, J., & Blackburn, R. (2015). *Anchor Institutions Small Firms in the UK: A Review of the Literature on Anchor Institutions Their Role in Developing Management Leadership Skills in Small Firms*, UKCES. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/414390/Anchor_institutions_and_small_firms.pdf (accessed on 24 October 2022).
- Smith, E., Smith, A., & Callan, V. (2024). The nature and benefits of partnerships between employers and training providers, *Journal of Vocational Education & Training*, DOI: 10.1080/13636820.2024.2417224.
- Spours, K., Coffield, F. & Gregson, M. (2007). Mediation, translation and local ecologies: understanding the impact of policy levers on FE colleges *Journal of Vocational Education & Training*, 59:2, 193-211, DOI: [10.1080/13636820701342889](https://doi.org/10.1080/13636820701342889).
- Spours, K. (2018). *From the general to the organic intellect: reflections on the concepts of connective specialization and the curriculum of the future* in D. Guile, D. Lambert and M. Rheiss (eds) *Sociology, Curriculum Studies and Professional Knowledge: New Perspectives on the work of Michael Young* Abingdon: Routledge.
- Spours, K. (2020). *Organic Thinking for the 4IR/AI Era: Specialisation, the General Intellect and 45-Degree Knowledge Production* Discussion Paper, UCL Institute of Education.

- Spours, K. (2023). *The Evolution of Social Ecosystem Thinking and the Social Ecosystem Model in Building Place-Based VET and Imagining Just Transition*. Stimulus Paper for the Symposium—‘Skills Ecosystems and Just Transitions’ Witwatersrand University, Johannesburg South Africa, 20–24 November. Available online: <https://www.kenspours.com> (accessed on 6 June 2024).
- Spours, K. (2024a). From Learning Ecologies to a Social Ecosystem Model for Learning and Skills. *Systems*, 12(10), 324–336.
- Spours, K. (2024b) *Social Ecosystem Thinking*. 2024. Available online: <https://www.kenspours.com/social-ecosystem-thinking>. (accessed on 3 July 2024).
- Spours, K., & Grainger, P. (2023). The mediating role of further and higher education in a Just Transition social ecosystem. *Journal of Vocational Education and Training*, 76(2), 307–330. DOI: [10.1080/13636820.2023.2258521](https://doi.org/10.1080/13636820.2023.2258521).
- Srnicek, N. (2016). *Platform Capitalism (Theory Redux)* Cambridge: Polity Press.
- Stansbury, A., Turner, D., & Balls, E. (2023). Tackling the UK’s regional economic inequality: binding constraints and avenues for policy intervention. *Contemporary Social Science*, 18(3–4), 318–356. <https://doi.org/10.1080/21582041.2023.2250745>
- Stringer, L., Dougill, A. Fraser, E., Hubacek, K., Prell, C. & Reed. M. (2006). Unpacking “participation” in the adaptive management of social–ecological systems: a critical review. *Ecology and Society* 11(2): 39. [online] <http://www.ecologyandsociety.org/vol11/iss2/art39/>
- Teixeira, C.P. & Fernandes, C.O. (2020). *Novel ecosystems: a review of the concept in non-urban and urban contexts*. *Landscape Ecology*, 35, pp. 23–39. Available at: <https://link.springer.com/article/10.1007/s10980-019-00934-4>.
- Trudeau, D., & Kruse, T. P. (2014). Creating Significant Learning Experiences through Civic Engagement: Practical Strategies for Community-Engaged Pedagogy. *Journal of Public Scholarship in Higher Education*, 4, 12–30.
- Weingart, P. & Masaan, S. (1997.) The order of meaning: the career of chaos as a metaphor *Configurations* (5) 463–520.
- Welsh, M. (2014). Resilience and responsibility: Governing uncertainty in a complex world. *Geogr. J.* 180, 15–26. <https://doi.org/10.1111/geoj.12012>.
- Wilkinson, J.; Kemmis, S.; Hardy, I.; & Edwards-Groves, C. (2009). *Leading and Learning: Developing Ecologies of Educational Practice*. Australian Association for Research in Education International Conference. Available online: <https://espace.library.uq.edu.au/view/UQ:209939> (accessed on 14 October 2022).
- Virolainen, M., & Heikkinen, H. L. (2018). ‘Vocational Education and Training Institutions’ Collaboration with the World of Work from the Perspective of Actor Networks and Ecosystems of Learning’. In L. M. Herrera, M. Teräs, & P. Gougoulakis (Eds.), *Vocational Education and Training: The World of Work and Teacher Education* (pp. 67–97). Premiss. Emergent Issues in Research on Vocational Education and Training, 3.
- Yoon, E.-S. (2024). From GERM (Global Educational Reform Movement) to NERM (Neoliberal Educational Reform Madness). *Critical Education*, 15(2), 13–28.

<https://doi.org/10.14288/ce.v15i2.186904>

Young, O.; Berkhout, F.; Gallopín, G.; Janssen, M.; Ostrom, E.; & Van der Leeuw, S. (2006). The Globalization of Socio-Ecological Systems: An Agenda for Scientific Research. *Glob. Environ. Change*, 16, 304–316. <https://doi.org/10.1016/j.gloenvcha.2006.03.004>.

Zeng, H. & Song, W. (2010). Metaphor analysis in the educational discourse: A critical review *US-China Foreign Language* 8 (9) 42-48.

Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. New York: Public Affairs.