Learning Ecosystems Trilogy
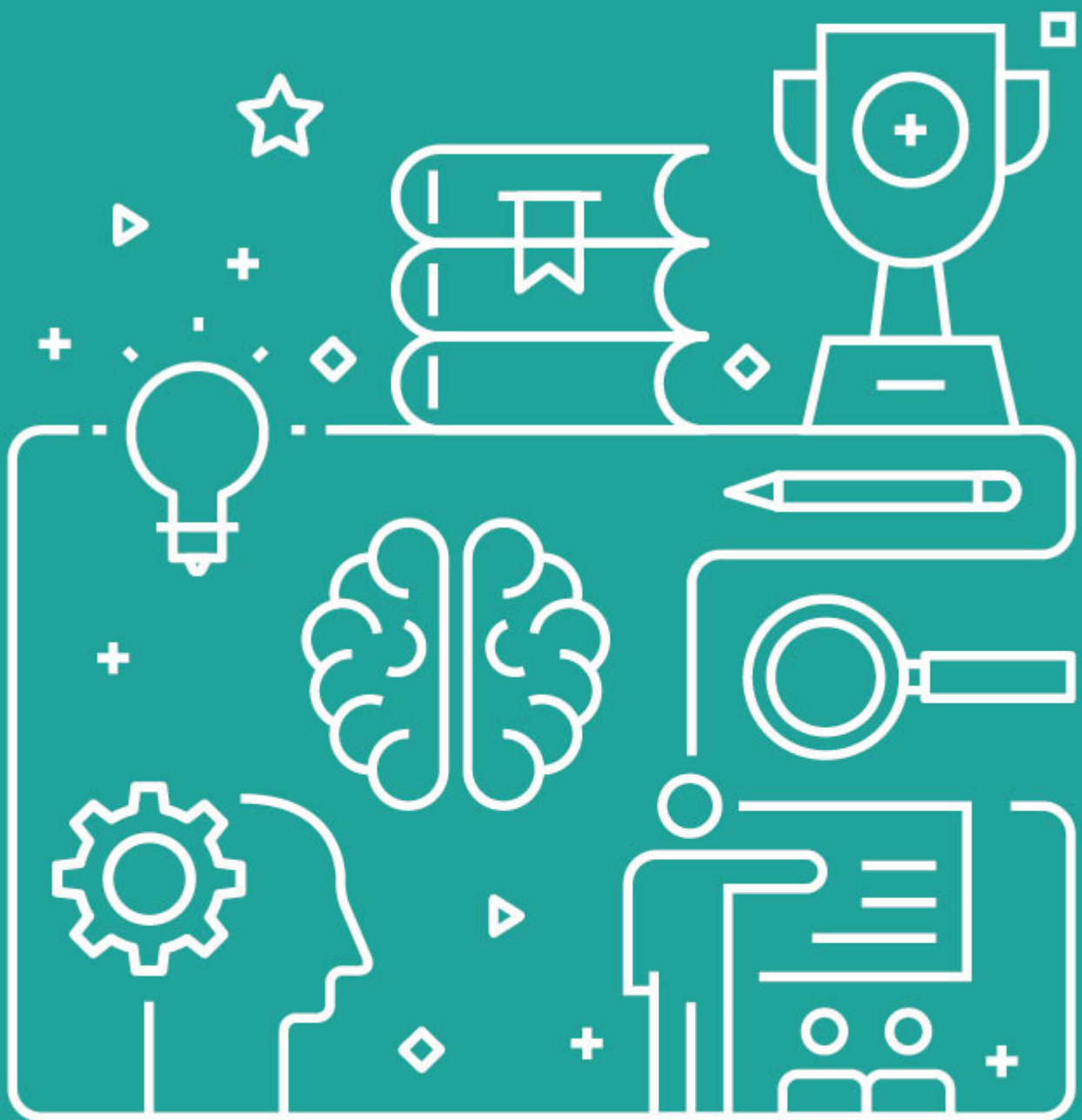# Evolutionary Framework

'Weaving our relational capacity for flourishing futures'

# License

Presentation

Dr. Jordi Díaz Gibson. Trilogy Lead. NetEduProject, Blanquerna, Ramon Llull University.

We are thrilled to present the 'Learning Ecosystems Trilogy', a collection of three reports that gather the intense international and collaborative research, discussion and practice led by the NetEdu team (PSITIC, Blanquerna-Ramon Llull University) in the last three years (2020-2023). Our key focus in the Trilogy is the urgent need of new educational leaders equipped and empowered to heal, seed and weave human connection and social infrastructure across our learning systems for flourishing futures. This is not about superheroes or superheroines, either about bottom up or top down change, it is about new leaders unfolding across spaces, facilitating and weaving the conditions for our collective emancipation and for a new system to emerge.
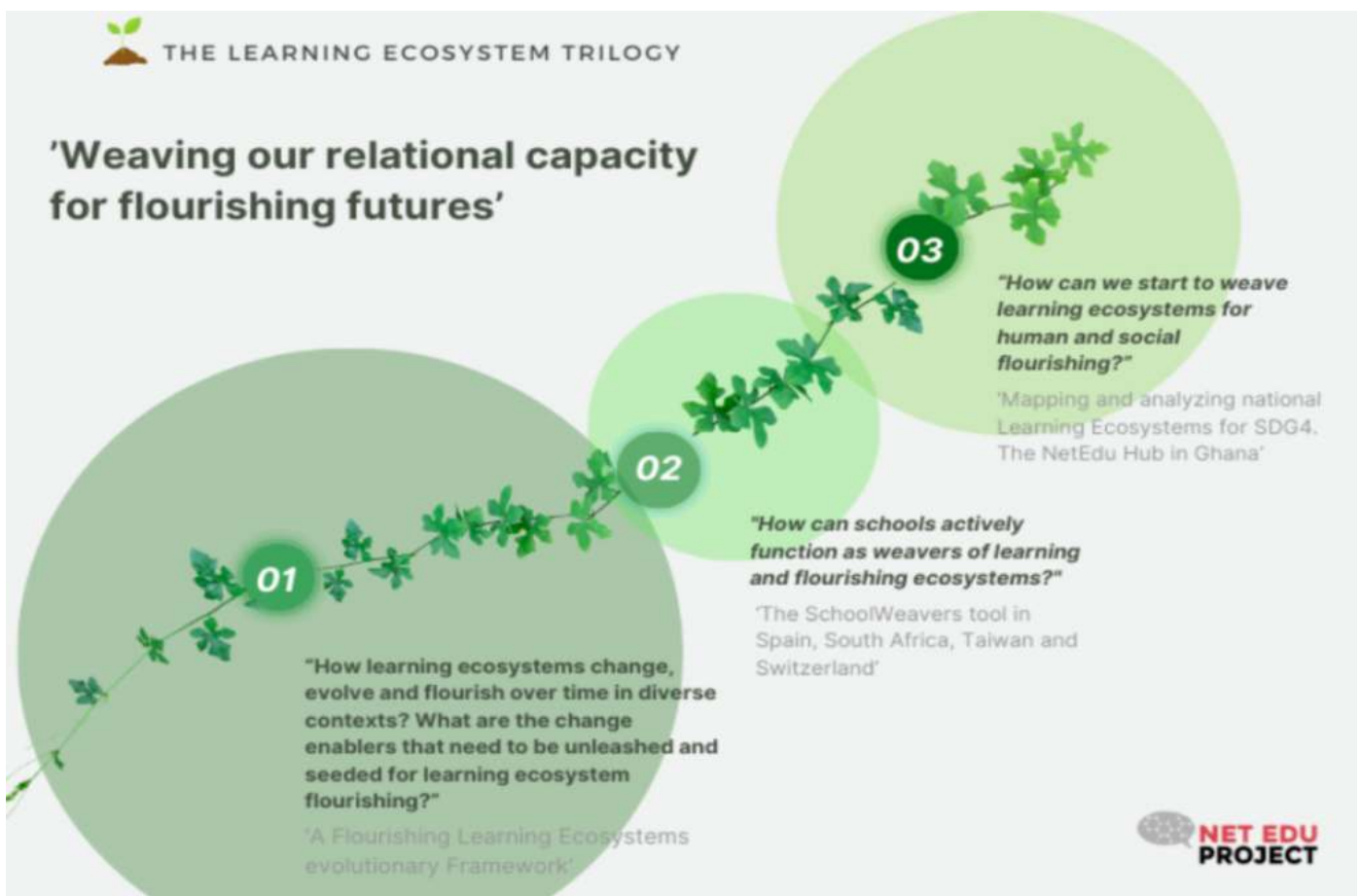
The Trilogy is formed by these three interlinked reports (NetEdu 2023).

Our work contributes to ground how ecosystemic leaders -or weavers- are becoming extremely influential in the learning ecosystems' growth, spanning multiple boundaries, seeding synergies, and empowering people, organizations and whole communities for deeper and wider learning and flourishing.

Learning ecosystems are evolving as a new paradigm that is interwoven with a diverse body of previous influential research as Bronfenbrenner's ecological systems theory (1974); Paulo Freire's Critical Pedagogy; Edgar Morin's Complexity Theory (2001); Provan, Milward, Kenis and Klijn's work around Interorganizational Networks and Network Governance (2001); Alan Daly's research on Social Networks in Education (2010); latest work of VanderWeele on Human Flourishing (2020), and the work led by Dr. Jordi Riera in PSITIC, Blanquerna Ramon Llull University, in the last 20 years around systemic and networked-based education. All these studies share a central idea: **hyper-fragmentation and isolation within our educational systems' silos is drastically reducing our capacities to interact, learn, feel well and evolve individually and collectively, a reality that has been globally visualized and exacerbated by the pandemic.** Thus, we are aware that we need to collaborate, co-create, co-design, and several co-, but we don't have the needed infrastructure and culture in place.

Learning ecosystems are complex and difficult to narrow, and we conceptualize them as the natural environments where people learn and unlearn across life time. So, an initial idea is that we all already live in learning ecosystems with diverse and contextualized characteristics as we inhabit the planet. Thus, learning ecosystems are influenced by many social forces of all diverse contexts, as resources, cultures, laws, policies, traditions, leaderships, organizations, people and relationships, among others. **Ultimately, our work takes a social and relational perspective to understand and weave learning ecosystems, underlying that learning and flourishing opportunities are inherently and actively shaped by a wide network of people and stakeholders that are specific from each context.**

Thus, this complex social network extends far beyond the traditional frame of family and formal education, including a wide range of influential individuals and organizations. Some of them interact directly with children and adolescents -*as schools, highschools, universities, libraries, community centers, theaters, museums, after school programs, sport centers, social networks, digital devices, video games, religious organizations, neighborhood spaces, among others*-. Others interact indirectly with them -as educational districts, municipalities, governments, Ed tech companies, among others. All of these stakeholders belong to diverse sectors -*including public, private, civil society and combinations of these three*-; *they are* part of multiple systems – *education, health, youth, wellbeing, technology etc*; including professionals from different disciplines -*as education, psychology, tech, sociology, health, architecture, research, and so on*-; and finally, all of them are learners. **Therefore, the relational capacities within and across the learning ecosystem determine the learning and flourishing possibilities and opportunities offered to all people and communities, especially to the most vulnerable ones.**

Working groups in the Learning Ecosystems' tool prototype. Greater Accra, Ghana 2022.

In the Learning Ecosystem Trilogy we take a careful and deep look into how leaders across the ecosystem weave this relational capacity in their contexts for deeper and wider learning and flourishing. And we understand the relational capacity of a learning ecosystem as 1- the social connection between all people, and 2- the social infrastructure that weaves the diverse parts of the system. And we will try to explain this idea a little further. Initially, we believe that seeding social connection becomes a central priority in our learning environments for individual and collective flourishing. We can't learn and flourish in an unsafe relational environment that makes us feel that we don't belong. As the Office of U.S Surgeon General states (2023), we live in a fragmented society where isolation and loneliness are a dangerous consequence of the imperative of our times, an epidemic that strongly affects health, learning and growth of children, young people, adults, teachers, leaders, parents, elders, whole schools, whole communities and so on. And we know that most vulnerable people and groups are the ones suffering more from this epidemic and its consequences. **Thus, social connection is a primitive human need at the core of the survival and evolution of our species, which is why that for flourishing futures we must prioritize ahead of instruction and achievement, the design of safe and flourishing environments that protects and supports us all across spaces and lifetime: students, teachers, educators, parents, etc. – especially the most vulnerable.**

Second, is the fact that social connection becomes, beyond a human need to be fulfilled, an invisible but powerful infrastructure that can enable or inhibit learning and flourishing opportunities for people and the planet. This idea suggests that **any desired change and transformation in education that we can dare to imagine, such as a new learning reform, method, strategy, tool, mindset, culture, leadership or policy, is directly influenced by the quality of our social connection among the people that are involved in all levels of the system -from design to implementation-.** Thus, change is inherently relational and systemic, starting with the inner relationship with ourselves, with relationship with territory and nature, including relationships between students, between student and teacher, between student and all educators that interact in the wider and natural environment; and last but not least, change is interdependent on all social connections between educators, leaders, social workers, health professionals and/or parents, among many others, that are also part of the natural environment where we all live and learn. **It is across this invisible social infrastructure -also named as social capital or social fabric- that we all interact, challenge ourselves, exchange resources, access new opportunities, learn, grow and find sense and meaning to our lives. Thus, the better we weave the social infrastructure in our systems and organizations, the greater will be the opportunities and possibilities for all to learn and flourish.**

The Learning Ecosystem Trilogy relies on initial descriptive studies emerged in the last decade where we have collectively explored and framed the learning ecosystems paradigm and learnt from worldwide experiences – UNESCO, Jacobs Foundation, WISE, Dream a Dream India, Global Education Futures, The Weaving Lab, Learning Planet, Remake learning, Education Reimagined, among others-. The Trilogy opens the door to a new level of development of studies in the field, presenting new experiential research-practice that aims to support leaders that are not aligned or even familiar to the ecosystemic approach to unfold the relational capacity in their communities and organizations for flourishing futures. Thus, the work presents the experience of more than 500 world wide education leaders playing and experimenting with new tools and frameworks, facing contextual resistances and contributing to understand real needs and elevate new thinking around our purpose. The Trilogy is formed by three complementary action-research reports where we explore crucial questions around how to weave Learning Ecosystems, claiming to inspire new leaders across the system -macro, meso and micro- to accelerate the development of our flourishing futures.

In Report I- *'An evolutionary Framework for Flourishing Learning Ecosystems'*, becomes a cross-analysis of data documented from all reports and gathers the intentional collaborative work of the NetEdu team around to answer: How learning ecosystems change, evolve and flourish over time in diverse contexts? What are the systemic enablers that need to be unleashed and seeded by decision makers and leaders in the ecosystem for learning and flourishing? **Thus, Report I is a deep dive into the dynamic and evolving nature of learning ecosystems, with the intention of prototyping a framework that can unravel the implications of a context responsive leadership to weave and overcome our standardized school-centered and isolated systems.** The next two reports become research based explorations in international contexts into the experience that school and regional leaders face to weave the relational capacities in their systems for deeper and wider learning and flourishing.

In Report II- '*SchoolWeavers Tool: Weaving ecosystems for belonging and human-centred learning*'-, we explore a crucial question in our framework: What is the role of schools as active weavers of learning and flourishing ecosystems? Schools are called to be central actors in the development and evolution of Learning Ecosystems as they play a central role in all countries, and have a tremendous impact on education and flourishment of our children and young. Nevertheless, evidence shows that schools worldwide are primarily designed for and focused on instruction and achievement, giving less attention to the design of caring, collaborative and innovative cultures within school walls and across the wider community, which in turn becomes essential for students' and teachers' learning and wellbeing. **Report II analyzes the SchoolWeavers as a tool that supports school leaders to weave learning ecosystems inside out, engaging and resonating with the community to collectively enhance a relational culture for learning and flourishing. The research-action work shares the experience of the tool in schools in Taiwan, South Africa, Switzerland and Spain.**

Finally, in Report III -'Mapping and analyzing national Learning Ecosystems for SDG4. The NetEdu Hub in Ghana '-, we study essential questions for leaders to initiate change: What type of tools, processes and synergies are needed to start collectively weaving the learning ecosystem? We have seen and experienced that mapping, visualizing and understanding learning stakeholders and relational dynamics in our schools, communities, cities or regions is already a significant and powerful part of the process of weaving learning ecosystems. But leaders in the meso and macro levels need tools to understand the potential of stakeholder relationships. **Thus, in this final report we share the development of a Learning Ecosystem Tool prototype that supports regional leaders and policy makers to visualize and analyze social connections between people and organizations in the ecosystem: the NetEdu Hub in Ghana.** The report describes the research based design and the tool prototype developed in collaboration with UNESCO and the Ministry of Education in Ghana.

In conclusion, the Trilogy is a direct call to governments, policy and decision makers to support, train and give wings to these new type of leaders to weave the relational and collective capacities in our learning ecosystems, taking care and empowering them is strategically fundamental for our flourishing futures. And finally, we deeply hope that this work offers all amazing weavers in the world a whisper of experiential inspiration, with new frameworks, guidelines, tools and processes, all of them to be discussed, adapted and lifted with new meaning and purpose to design and lead flourishing learning ecosystems worldwide. They truly are one of the philosopher stones for our flourishing futures.

Gratitude

The shared learning journey has been rich and complex, deeply impacted by the COVID 19 pandemic and post pandemic forces, but full of inspiration and meaning. It has been a complete honor to share this journey with a team of amazing human beings, extending our collaboration across more than 1000 thoughtful and committed educators and leaders from the five continents. They all meaningfully enriched every single thought and piece of this Trilogy.

NetEdu Team, Authors of the Trilogy Reports

Jordi Díaz-Gibson (Ramon Llull University); Robyn Whittaker (Kaleidoscope Lights); Mireia Civís (Ramon Llull University); Yi-Wha Liou (National Taipei University); Dale Allen (DXtera Institute); Peter Fagerström (Educraftor); Enikö Zala-Mezö and Daniela Muller-Kuhn (Zurich University of Teacher Education), Centre for School Improvement); Akwasi Addae-Bohane (T-TEL Ghana); Eric Ananga (T-Tel); Avril Kudzi (Jacobs Foundation); Lana Jelenjev (The Hum); Anna de Montserrat, Annabel Fontanet, Mireia Lerena, Míriam Cos and Estel Torruella (Ramon Llull University).

Learning Ecosystems Trilogy:

'Weaving our relational capacity for flourishing futures'

Report 1:

An Evolutionary Framework for Flourishing Learning Ecosystems

Authors

Jordi Díaz-Gibson (Ramon Llull University); Robyn Whittaker (Africa Voices Dialogue / Kaleidoscope Lights); Mireia Civís (Ramon Llull University); Peter Fagerström (Educraftor); Akwasi Addae-Bohane (T-TEL Ghana); Avril Kudzi (Jacobs Foundation); Mireia Lerena (Ramon Llull University) and Lana Jelenjev (Neurodiversity Foundation).

Executive Summary

The Flourishing Learning Ecosystems Evolutionary Framework stands as a meticulously detailed and research-driven methodology, delving deep into the nuances of how learning ecosystems expand, adapt, and transform through various phases of their existence. Birthed from relentless years of global research, dialogues, and partnerships, this framework isn't just a theoretical construct; it's a strategic compass aimed at enlightening educators, leaders, and policy architects on shaping robust and flourishing learning environments.

At its core, the framework unravels the intricate dance of interactions within an ever-evolving learning landscape. It intricately weaves the principles of developmental ecosystem dynamics with cyclical disturbances, highlighting that learning isn't linear, but a pulsating journey of growth, adaptability, and resilience. The accentuation on relational dynamics underscores the significance of collaborative interdependencies, spotlighting how these connections invigorate the ecosystem's capability to rejuvenate and expand.

What makes the Flourishing Learning Ecosystems Evolutionary Framework particularly noteworthy is its empirical foundation. It encapsulates insights and experiences from a vast cross-section of over 500 educational trailblazers spanning all five continents. This rich tapestry of data, collected through rigorous interviews, online and in person interactive focus groups, and surveys, underwent meticulous analysis by a dedicated team and was further subjected to external scrutiny by seasoned experts.

However, it's essential to understand that this framework isn't the final word but a dynamic entity. It's beckoning to delve into a collective quest to continually refine our understanding of flourishing learning ecosystems. Rather than being an exhaustive manual, it serves as an open-ended conversation starter, nudging stakeholders, both within and outside the educational realm, to co-create an ever-evolving blueprint that responds to the multifaceted shifts in our global landscape. Ultimately, the Flourishing Learning Ecosystems Evolutionary Framework stands as a beacon for all those passionate about sculpting vibrant, adaptive, and impactful flourishing learning ecosystems.

Key findings

1. Continuous Evolution is Imperative: Flourishing Learning Ecosystems can evolve into 4 evolutionary stages of maturity: Emergent, Young, Mature and Climax. Our learning ecosystems are affected by context alterations and must remain in a state of perpetual evolution. To make this a reality, it's essential to support the role of weavers across the system, being connected to ongoing research, embracing fresh perspectives, and courageously exploring new territories.

2. A Systemic model with no centers, where 7 evolutionary conditions -Learners, Stakeholders, Relational Dynamics, Structural Dynamics, Digital, Leadership, Monitoring and assessment- enable the growth of the ecosystem, and become systemic change nodes that are also influenced by each other.

3. Embracing a Hybrid Culture for Learning and Flourishing: The Framework focuses on building social connection and social infrastructure to strengthen the flourishment and resilience of the whole ecosystem as an organic entity. It focus on the relational conditions that foster flourishing and learning of all stakeholders, rather than overfocusing our resources on a mechanistic approach based on effectiveness and final students results.

4. Ecosystemic Leadership is Paramount: Our research suggests that every learning environment has its own unique nuances. Leadership strategies across identified dimensions should be fluid, adaptable, and tailored to meet the specific needs and requirements of each ecosystem, with a crucial focus on the relationships between humans and organizations in diverse parts of the system.

5. The Tech and Digital system is interdependently connected with the wider Learning and Flourishing Ecosystem. The evolution of the ecosystem is pictured by the progressive closeness between these systems, organizations and professionals, connecting technical knowledge, human ethics and values, learning and flourishing requirements.

6. The Evolutionary Framework is a tangible resource for leaders and changemakers across the system -as researchers, policy makers, implementers, entrepreneurs and funders- and across continents and hemispheres. Thus, it becomes a shared board to come together and start the ideation and prototyping of new tools and methods that strengthen our ecosystems for greater flourishment and learning, empowering our unexplored collective capacities to face the tremendous challenges that we already have and new ones that will emerge

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1. Introduction

Many research reports such as those by UNESCO (2022), Economist Impact (2022), OECD (2017) are alerting the education community, and society in general, that schools and other learning stakeholders can't be isolated and alone in addressing complex learning and social challenges such as the ones posed by SDG4- particularly insofar as student wellbeing and holistic education is concerned. These reports indicate that schools and educational districts need further collaboration between local and global stakeholders within the system to be successful. A learning ecosystem approach postulates that we all live, learn and evolve in existing and diverse learning ecosystems across multiple spaces, environments and stakeholders, which play a role in influencing and configuring our access to learning. At best, healthy learning ecosystems offer diverse learning opportunities that can emerge from different places, institutions, communities and other areas in our daily lives. Increasing our understanding of learning ecosystems for new cross-system organization, and deepening our capacity to visualise and support its evolutionary nature can support policymakers, change leaders and educators to understand the complexity and nested nature of our society's challenges, and accordingly, overcome the hitherto largely siloed responses to education challenges.

Studies before, during and after the pandemic demonstrate that there is a serious lack of social infrastructure in our communities, cities and regions (Economist Impact, 2023; UNESCO, 2022; Office of U.S Surgeon General, 2023) Social infrastructure may be understood as the conditions needed for social connection between people, organizations, as well as between parts of the system such as formal and informal education; public and private education; physical and virtual spaces; kindergarten, primary, secondary and post-secondary stages; school and community; students and school; families and school, teachers and researchers; hard and soft skills; and education and learning, among others. The deficit of social infrastructure has clear consequences for our learning systems, as it results in the hyper-fragmentation of the educational systems, with the implementation of siloed responses each produced separately from the diverse parts of the system, giving rise to a lack of coordination and waste of public and private resources, as well as social isolation of the stakeholders within the system.

In particular, it should be noted that social isolation and loneliness has tremendous negative effects on our individual, organizational or community health and wellbeing. Social isolation occurs when few meaningful social relationships, social roles, group memberships, and infrequent social interaction, is present, and can be experienced by individuals, but also by groups of people - such as families, schools, communities or other organizations. Multiple studies indicate that loneliness and isolation are more widespread than many of the other major health issues of our day, including smoking, diabetes and obesity. As the Office of U.S Surgeon General (2023) states, loneliness and social isolation increase the risk for premature death by 26%. Furthermore, the presence or absence of social connection also affects the communities we live in, becoming an important social determinant of health, and more broadly, of community well-being, including population health, community resilience when natural hazards strike, community safety, economic prosperity, and representative government.

Learning ecosystems have gained exponential attention in the last decade as a new global paradigm for holistic learning in our complex times (UNESCO, 2022; Economist Impact, 2023). Learning Ecosystems become a systemic approach that envision a relational evolution of our existing educational systems around the globe, focusing on the need for deeper and wider interconnection between and across systems, stakeholders and learners to collectively flourish and learn, as we face SDG4 challenge. We already live in contextualized and extensive learning ecosystems with specific stakeholders, existing relationships and specific social infrastructures that facilitate or inhibit learning opportunities. However, in most instances these learning ecosystems are not specifically attended to, visualised, or intentionally supported. Moreover, our learning ecosystem approach has no center, as all elements of a system are influencers of and are influenced by their context. An example would be that teachers' learning and wellbeing directly affects student learning and wellbeing. Thus, what is of our specific interest in this initial report are the systemic conditions that explain the evolutive characteristics of learning ecosystems, in other words, how flourishing learning ecosystems interact and evolve over time. In this sense, we need an evolutionary learning ecosystem framework that has an expansive focus and includes in the map all learning stakeholders from diverse disciplines and systems, but also takes into account other relevant and systemic enablers that facilitate ecosystems' growth.

Figure 1: Biological and Learning Ecosystems evolutionary stages (NetEdu, 2023)
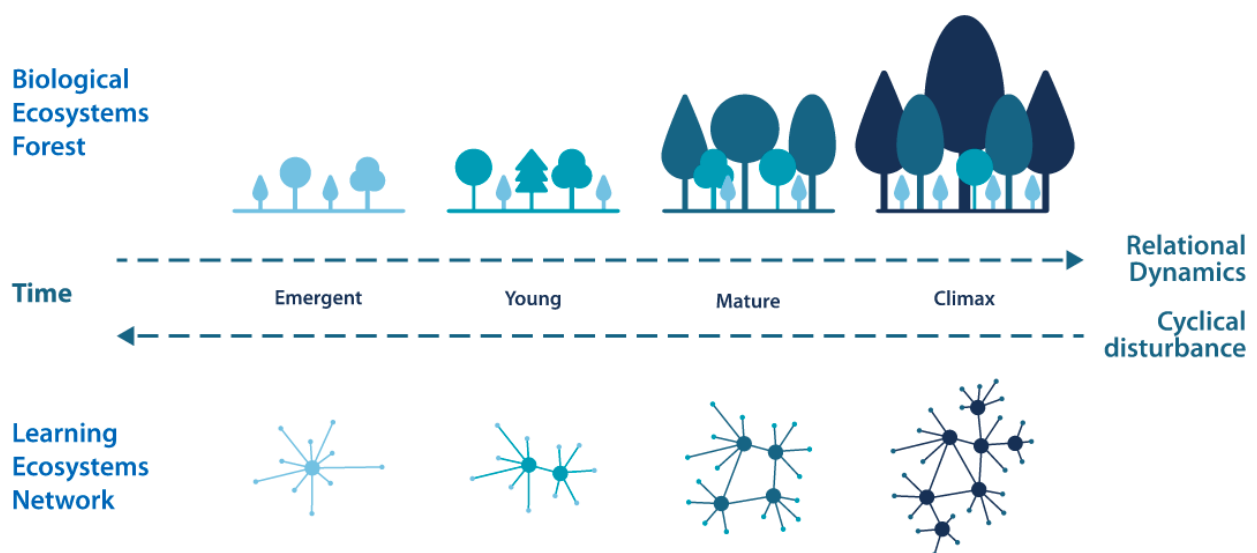

Source: NetEdu 2022

In this sense, the learning ecosystems approach proposed in this Evolutionary Framework mirrors the ways in which natural ecosystems evolve. Ecosystem evolution is the process of change in the species structure of an ecological community over time. Time and positive interaction within structural and relational dynamics are compulsory variables for ecological and learning ecosystems to change and evolve. Thus, relational dynamics in the ecosystem refer to those intrinsic functions and energies through which an ecosystem becomes healthy, self-regulating, self-sustaining, and capable of recovery from the negative external forces and alterations that cause cyclical disturbance. Thus, within a learning ecosystem, positive relational dynamics empower the ecosystem's regenerative capacity and enable its growth over time. An ecosystem's evolution is also impacted by the natural effects of cyclical disturbances, understood as a temporary change in environmental conditions that causes a pronounced disruptive change in an ecological and/or learning ecosystem. The Flourishing Learning Ecosystems Evolutionary Framework which we present here articulates the interactions within a living and evolutionary process that combines the elements of both developmental ecosystem dynamics and cyclical disturbances. The framework becomes an initial resource that responds to the need of grounded frames and tools that support leaders across the system to inspire and activate new learning narratives, new decisions and new advanced practices.

This report is part of the process of deep analysis of all field work carried in the Trilogy between 2021 and 2023 by the team, and comprises data gathered from more than a 500 global education leaders from the five continents, working at different levels of the system. The data gathered through interviews, focus groups and surveys has been deeply discussed and analyzed by the team and externally reviewed by experts on the field, to collectively design the initial draft of the present framework. The Evolutionary Framework for Flourishing Learning Ecosystems aims to inspire policy makers and leaders to better understand and support the systemic and evolutionary elements necessary for the progression of flourishing learning ecosystems at a macro level -local and national-. Learning ecosystems worldwide have a strong contextual component, in the same way that biological ecosystems can be found in diverse different contexts, such as oceans, forests, deserts, large cities, high mountains, and so on. In this initial conceptual phase of this framework, the dynamic conditions that fuel the ecosystems' growth have been identified as:

Evolutionary Framework of Learning and Flourishing Ecosystems summary (NetEdu, 2023)

DIMENSION: STAKEHOLDERS

EMERGENT   YOUNG   MATURE   CLIMAX
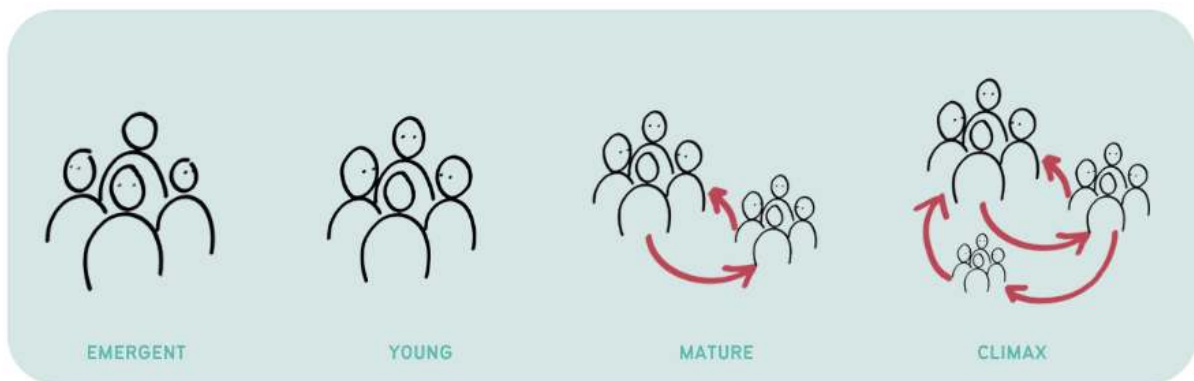
DIMENSION: STRUCTURE
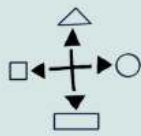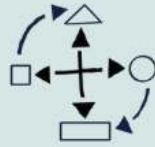
| EMERGENT | YOUNG | MATURE | CLIMAX |

DIMENSION: LEARNERS

| EMERGENT | YOUNG | MATURE | CLIMAX |

DIMENSION: RELATIONAL DYNAMICS
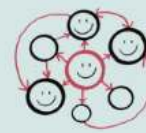
| EMERGENT | YOUNG | MATURE | CLIMAX |

DIMENSION: DIGITAL ECOSYSTEM

| EMERGENT | YOUNG | MATURE | CLIMAX |

DIMENSION: LEADERSHIP

| EMERGENT | YOUNG | MATURE | CLIMAX |

DIMENSION: MONITORING EVOLUTION
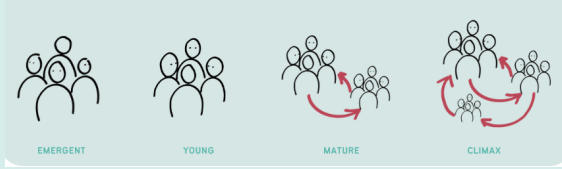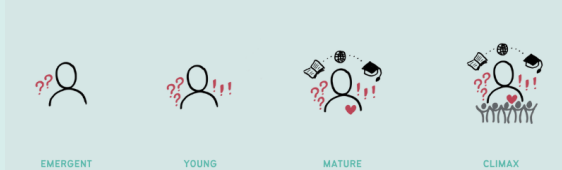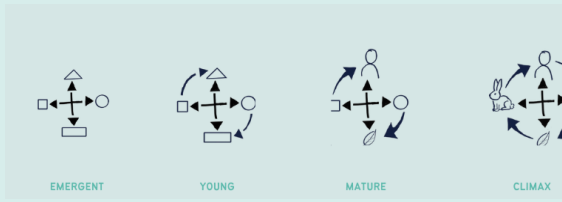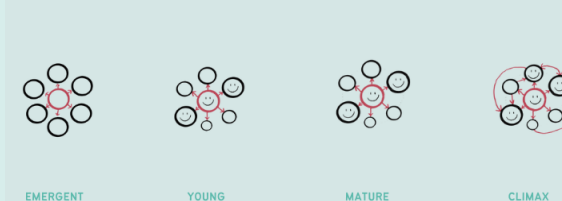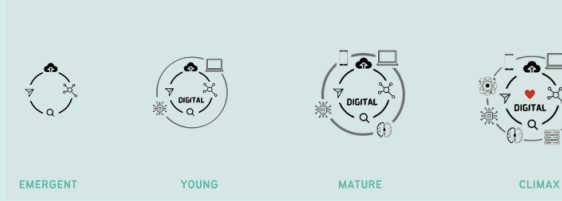
| EMERGENT | YOUNG | MATURE | CLIMAX |

Evolutionary Framework of Learning and flourishing Ecosystems summary (NetEdu, 2023)

Evolutive Dimensions	Enablers
1. Stakeholders People or organizations within the ecosystem that have an interest, implication and influence in education and learning. 	DEFINITION
	DIVERSITY
	ROLES
	ATTITUDES
2. Learners All the people that can gain knowledge, skills, competences, values, etc. throughout their lives and across spaces. 	DEFINITION
	PURPOSE
	SCOPE
	INCLUSION AND EQUITY
3. Structure Structural fabric and policy elements of a learning ecosystem that enables it to evolve. 	POLICY & DEVELOPMENT FRAMEWORK
	POWER
	CONNECTIONS
	RESOURCE FLOW
4. Relational Dynamics Social and cohesive outcomes that develop the relational fabric and resilience in the ecosystem 	SHARED PURPOSE
	TRUST
	COLLABORATION
	WEAVING
5. Digital and technological Learning Ecosystem Hybridization and connectedness of the digital and tech systems within the learning ecosystem. 	DEFINITION
	PERSPECTIVES
	INFRASTRUCTURE
	CONNECTION
6. Ecosystem's Leadership Energizing and co-shaping Structural and Relational dynamics for ecosystems' evolution and holistic achievement of learning and flourishing outcomes 	PURPOSE
	FOCUS
	POWER REDISTRIBUTION
	CULTURE
7. Monitoring Evolution Systematic tracking of ecosystem's Evaluation, Assessment, Reflection, collective Learning, Understanding, and evolutionary Actions 	DEFINITION
	PURPOSE
	DATA MANAGEMENT
	EVOLUTIONARY PROCESS

LEARNING ECOSYSTEMS TRILOGY REPORT 1 EVOLUTIONARY FRAMEWORK.

Learning ecosystems are dynamic and in constant evolution, and their rate and direction of change depends on the abovementioned 7 evolving conditions that act as enablers or inhibitors in a social environment. Alongside the 7 conditions and specific enablers, learning ecosystems progress through 4 evolutionary and non-linear phases of growth that echo how natural ecosystems evolve - from emergence, to young, mature and climax ecosystems.

The present report is the theoretical framework that grounds the Learning Ecosystem Trilogy and has been led by the NetEdu team (Blanquerna, Ramon Llull University), and commissioned by UNESCO and the Jacobs Foundation. The final aim of the Evolutionary Framework is to develop a holistic approach that grounds and connects new emerging tools, relational processes and practices that are emerging and will emerge around the world to enable the evolution of our learning and flourishing ecosystems. The Framework also claims to better ensure inclusive and equitable quality education and promote lifelong and life-wide learning opportunities for all prompted by SDG goals. Thus, the Evolutionary Framework finally aims to lift the dialogue, inspire and support leaders and policy makers to weave new policies, new relationships, new cultures and new practices that seed positive interdependencies within a regional learning ecosystem to enhance systemic growth together with learning and flourishing outcomes. This work is not about systems that work and systems that do not work, it is about illustrating and documenting the dynamic and evolutionary nature of learning ecosystems.

2. Flourishing Learning Ecosystems

The COVID-19 pandemic has dramatically impacted our educational systems and stressed school communities, increasing student mental health issues, learning gaps and social inequalities. This crisis is even more severe in some countries in the Global South such as India, where children were out of school for more than 600 days due to COVID shutdown, with many struggling to access health and nutrition services, sanitary items, or even go out to play. These setbacks are affecting children and adolescent's mental health and well-being, with striking increases in depression and anxiety (Meherali et al., 2021; Minozzi et al., 2021; Rajmil et al., 2021) and decreased life satisfaction (Rajmil et al., 2021). In addition, teachers are experiencing increased burnout and stress (MacIntyre et al., 2020; Hascher et al., 2021; Pöysä et al., 2021). More than ever, regenerating and supporting students' well-being together with lifelong learning opportunities is urgent for building sustainable, equitable and resilient societies (UNESCO, 2022). Therefore, evidence in a post pandemic context indicates the urgent need to connect the interdependence of learning and the wellbeing in practice, arguing that there is no learning without wellbeing and vice versa. This hybridization leads us to the concept of 'human flourishing'- as a state of complete human well-being and growth (VanderWeele, 2017). Human flourishing stands for the relative attainment of a state in which all aspects of a person's life are good, including the contexts in which that person lives (VanderWeele and Lomas, 2023).

To achieve progress on an enormously complex, multidimensional challenge such as holistic learning and flourishing of our children and adolescents, so as to create the necessary conditions for SDG4, it requires regions and cities to engage and weave a wide diversity of influential stakeholders far beyond the traditional actors already involved in the formal education system (UNESCO, 2019). In the last 30 years, intentional resources have been invested around the globe to holistically reform and better connect educational systems by re-imagining new organizational approaches, models and methods for learning in the 21st century (Diaz-Gibson et al, 2020; Global Education Futures, 2020; UNESCO, 2020; WISE 2018 and 2022). These disruptive efforts have emerged from both bottom-up and top-down directions within the system, however in most instances have been mainly local and contextually specific. These efforts have been sustained and co-led through largely collaborative approaches, involving stakeholders from diverse sectors -public, private and civil society-, disciplines -educational, wellbeing, health, digital and so on-, and levels of administration -local and regional. Their overarching aim has been to empower the systems' capacities to provide children with the fundamental experiences and skills needed to thrive individually and collectively in today's world.

Thus, there has been a growing interest in understanding educational change from a systems field perspective to better respond to complex challenges as SDG4, deepening the needed shifts for the evolution of our societal systems. Systems change captures the idea of addressing the causes -rather than the symptoms- of a societal issue by taking a holistic or systemic view. Systems change is about understanding the holistic mechanisms that drive or inhibit change, and is generally understood to require adjustments or transformations in the policies, practices, power dynamics, social norms or mindsets that underlie the societal issue at stake. It often involves the collaboration of a diverse set of stakeholders and can take place on a local, national or global level (Catalyst 2030). In this sense, researchers, policy makers and leaders from around the world have come together to map best practices and to prototype new approaches to learning from a local and systemic perspective.

Global empirical research shows that enhanced school-community and/or district collaboration between interdisciplinary stakeholders is correlated with multiple positive outcomes such as systems innovation, innovative climates in schools and communities, greater achievement in deprived areas, enhanced parental involvement in child learning, greater levels of social capital and trust development, and increased personalized learning and learner participation in school and community governance (Daly, 2010 and 2020; Díaz-Gibson et. al, 2020; Azorín and Harris, 2020; Clayton, 2016; Luksha et. al, 2020; Ion & Brown, 2020, Economist Impact, 2022; Longás et al, 2019, among others).

Furthermore, the global COVID-19 pandemic with the resulting long term lockdowns, and the experience of schools' reopening worldwide, has increased the need for stakeholder dialogue and collaboration across sectors and disciplines - such as education, technologies, health, social services, culture, media and so on- and sectors - public, private and civil society-, to effectively respond to the complex social challenges that are impacting on the progress towards SDG4, and that have been highlighted by the pandemic (UNESCO, 2021). The World Health Organization and UNESCO, among others, calls for countries to recognize and strengthen the interdependent relationship between education and health of children and adolescents by intentionally focusing on the relational environment and opportunities to promote social well-being and mental health of the different members of the school community (WHO, 2021; UNESCO, 2022; Duff et al., 2016; Velasco, 2021).

Several reports from prestigious and influential international organizations have paid increasing attention to better grasping the essence and practice of systems change in all levels of our educational systems, converging in naming this new perspective as 'Learning Ecosystems'. The notion of ecosystems originates in the study of evolutionary biology, where ecosystems are defined as "a biological community of interacting organisms and their physical environment". Drawing from this, the concept of a human ecological system was articulated by Urie Bronfenbrenner (1979) who proposed that human development, and particularly child development, is influenced by factors operating at various levels within a broad ecological structure, in which each level and component part exerts reciprocal influences on the others. According to Global Education Futures' (2020), Learning Ecosystems are emerging worldwide as an interdisciplinary response to the increasing complexity of the 21st century at a time when humanity is changing the very trajectory of evolution on Earth, and needing to reckon with our choices to date as a species. In this report, Lucksha et al. (2020) define learning ecosystems as intentional webs of relational learning which are dynamic, evolving, and enable greater diversity when fostering lifelong learning opportunities. The purpose of learning ecosystems is to offer pathways for learners to actively co-create thrivable futures for people, places and our planet.

The WISE Living Lab Playbook: Designing Learning Ecosystems (2022) reflects that entities such as these are already in existence, providing education and learning directly to learners, and comprising open and evolving communities of diverse providers that cater to the variety of learner needs in a given context or area. Such existing systems may be at a variety of different stages in their levels of efficacy, connection and growth, and are usually supported by an innovative credentialing system or technology that replaces or augments the traditional linear system of examinations and graduation. Also, 'A Learning Ecosystem Framework' (2022), a recent report authored by the Economist Impact and commissioned by the Jacobs Foundation, provides comprehensive framework and defines learning ecosystems as diverse, collaborative and dynamic networks of stakeholders that enable greater access to a range of learning opportunities and help young people achieve positive learning and wellbeing outcomes. This report also provides an extensive revision of educational systems data from 20 diverse countries, showing evidences that are highly relevant for the development of national learning ecosystems, such as: holistic action to support the learning and wellbeing of young people is lacking globally; more emphasis is needed on ensuring conditions that are conducive to the success of all stakeholders within the school environment; access to safe and high-quality community spaces for young people is lacking; education stakeholders see the value in greater collaboration between different learning environments to support young people, but levels of collaboration remain low; and finally, a lack of specific data that gathers insight on the relational conditions of learning ecosystems challenges the ability to evaluate systems and track progress.

Learning ecosystems become a systemic and holistic approach to the natural evolution of our educational systems around the globe, nurtured by the prolific and complex dialogue between isolation-hierarchies and collaboration-networks, and challenged by our individual and collective learning beliefs, organizational cultures, professional mindsets, expectations and practices. From our perspective, flourishing learning ecosystems are grounded on the contextualized and evolutionary conditions and opportunities that a specific space (school, community, district, region etc.) - both physical and virtual- offers for all people to learn and flourish. The development of the conditions and opportunities for learning is socially mediated by an extensive relational network of people and organizations, but also influenced by other artifacts such as policies, incentives, beliefs or behaviors that are inherently interdependent in providing all people with equitable opportunities and experiences to flourish, reach their full learning potential and thrive together.

Research in the last decade suggests that weaving healthy and resilient learning ecosystems in our regions, cities, communities and schools has become one of the greatest worldwide challenges and opportunities for our systems in order to allow them to focus on enhancing lifelong, lifewide and lifedeep learning and creating increased access and a deeper focus on equity in education. Nevertheless, the concept of Learning Ecosystems is still under construction and we need empirical evidence on how these ecosystems evolve over time in diverse social contexts, and also what are the mid-term outcomes that they can produce on our learning and educational systems (Díaz-Gibson et al, 2020). Thus, reports and research papers (Economist Impact, 2022; UNESCO, 2020; WISE, 2022; Díaz-Gibson et al. 2020) conclude that one of the strongest inhibitors to progressing this model is the absence and dearth of approaches, frameworks and defining metrics allowing us to visualize, prioritize, track, understand, and reflect on how ecosystems evolve and operate in order to potentially increase our learning goals.

3. Research Methods

The present Framework is part of the process of the deep analysis of field work developed in the Trilogy between 2021 and 2023 by the team. All the data gathering and analysis is fully documented by the team. Research methods are divided in 3 stages:

Stage 1 includes an initial analysis of data gathered from more than 500 global education leaders at different levels of the system. The NetEdu team organized and analyzed all these data obtained through interviews, online workshops, on- site focal groups, and surveys in the process of development of Report II and Report III in the Learning Ecosystems Trilogy.

Stage 2 involves a secondary analysis developed by the NetEdu team through 25 focal groups. This dialogic process aimed to internally interpret and curate data, discussing dimensions, designing an evolutionary process and fully describing evolutionary indicators. Finally, in;

Stage 3 the framework was shared, reviewed and consulted by 9 international experts in the field of learning ecosystems. Experts send back reviewing reports and comments that lifted and improved the framework. Some of the comments suggested to shorten or clarify descriptions, connect dimensions to other existent frameworks, deepen the connection with SDG4 development, or strengthen the evidence based model. Afterwards, a final version of the framework was developed and elaborated as it is presented in this study.

4. A Flourishing Learning Ecosystems Evolutionary Framework

The Evolutionary framework of Flourishing and Learning Ecosystems which we present here articulates the interactions within a living and evolutionary process that combines the systemic conditions and enablers that facilitate the non linear growth of the macro ecosystem. The aim is to focus upon and create an orientative and systemic map that represents a spectrum of the evolutionary potential and progression of a flourishing learning ecosystem. All national and/or regional educational and learning ecosystems have a strong contextual component, in the same way that biological ecosystems can be diverse, for instance oceans, forests, deserts, large cities and so on. In our conceptual phase of this framework, the dynamic conditions that fuel the ecosystems' growth have been identified as: 1. The number and diversity of **Stakeholders**; 2. Purpose and scope of **Learning**; 3. **Power** dynamics in the structure; 4. **Relational dynamics** influencing social relationships; 5. **Digital** and learning connectedness; 6. Ecosystemic **Leadership**; and 7. **Monitoring, assessing and evolutionary** approaches. Flourishing Learning ecosystems are dynamic and in constant evolution, and their rate and direction of change depends on the evolving conditions in the social environment. Learning ecosystems that have been identified and studied so far share core human and relational foundations, and can relatively easily be seen as fitting into some phase of the articulated evolutionary framework as shared here. Our model represents an evolutive picture that frames Learning Ecosystems and the 7 dynamic conditions outlined above within 4 evolutionary and non-linear phases of growth.
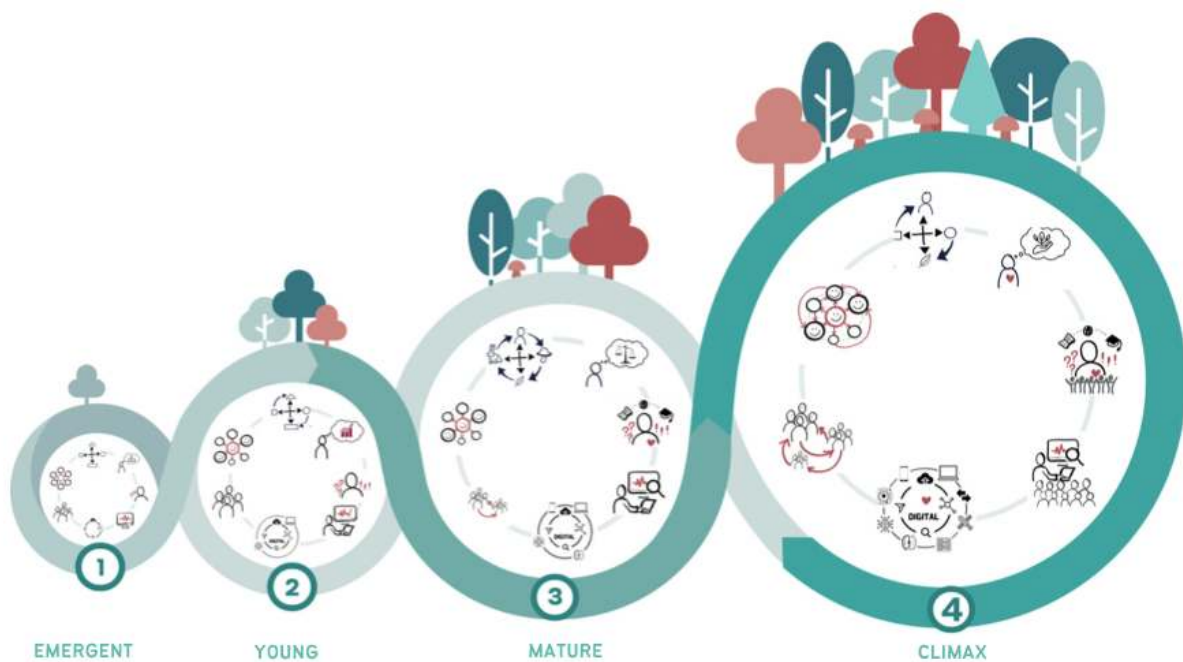

Figure 2: Evolutionary Framework for Flourishing Learning Ecosystems

Figure 2 frames the model as a dynamic process that aims to support leaders and policy makers to better understand the system dynamics, enhancing their ability to activate complex collaborative, cross-sectoral and cross-disciplinary processes for the development of flourishing learning ecosystems for holistic outcomes and attainment of SDG4. Represented within the evolving circles are the dynamic interactions of the 7 conditions mentioned above, that themselves experience a nonlinear evolution across the stages. In order to support a conceptual insight into the process, the stages described below echo how forests evolve in natural ecosystems from pioneer plants, and through a process of emergence, to young, mature and climax ecosystems.

The evolutionary dimensions and specific enablers happen to be systemic, evolving as a network of interdependent nodes. As Hecht and Crowley (2020) state, from Bronfenbrenner on, models of human ecology and learning ecosystems have often been visually represented with an individual at the center of the system, indicating that forces from the environmental context exert influence on the individual, often depicted as a child. This representation of learning ecosystems can be found in many recent frameworks of learning ecosystems, models that connect school systems with informal, out-of-school learning (Bevan, 2016), and has also been used to describe domain-specific learning, such as STEM education (National Research Council of the National Academies, 2015). From our perspective, the persistent focus on youth as the center of the learning ecosystem undermines the potency of the ecosystem framework, perpetuating the idea that learning happens at the individual level, has a centralising focus on a single point, and that systemic inequity can be addressed primarily by supporting opportunities for individuals.

The Evolutionary Framework has no center, but systemic and evolutionary conditions. All dimensions and enablers are influencers of and are influenced by each other, and also by their context. In consequence, the elements of this framework can never be fully teased apart. Following the example posed by Hecht and Crowley (2020), it is widely accepted in ecology that trees have important functional relationships with fungi, called mycorrhizae, which grow on tree roots. These fungi have been used to help characterize the expansive nature of complex systems (Engeström, 2007). In forest ecology, the relationship between mycorrhizae and trees is thought to support more than just the individual tree, and instead supports ecosystem function across multiple plants and mycorrhizal species (Ferlian et al., 2018). Thus, in the Evolutionary Framework **learners become a subject for evolution**, and specific growth from emergent to mature stages shows the progression of this specific decentralization, evolving practices where all stakeholders are learners in an ecosystem, and also that learning from one stakeholders influences others and so on.

In this sense, the framework also brings a **decentralized perspective of leadership** in what we frame as a human and biological approach to educational leadership. Learning ecosystems have great potential for developing and growing to become more organic, interconnected and collaborative. This has been clearly evidenced in some of the existing and developing learning ecosystem models that are emerging around the world (WISE, 2022; Economist Impact, 2022). The way biological ecosystems change and evolve over time mirrors and informs our approach and understanding of local learning ecosystems' development and growth processes (Díaz-Gibson et al., 2020; Lucksha et al, 2020). Science shows us that collaboration, symbiosis and interdependence between organisms and species, not struggle for survival, competition or absolute domination, allows for ecosystems to evolve and species to truly flourish. As Darwin defended, if humans are the most advanced species it's because we have the most advanced means of collaborating, and our communities are capable of caring for the most vulnerable, the sick, the elderly and impoverished. Thus, diversity and collaboration are actually natural and social drivers for species survival and for thriving communities.

Ecosystem evolution is advanced by ecological succession, understood as the process of change in the species structure of an ecological community over time, where a network of different populations and organisms coexist and interact in a dynamic and evolving dance. As biodiversity is a result of the richness and growth of a biological ecosystem, **stakeholder diversity** becomes a central component in the evolution of learning ecosystems. The time scale for a biological ecosystem to evolve can be decades -for example, after a wildfire-, centuries, or even millenia. Biological ecosystem establishment begins with relatively few pioneering plants and animals and develops through increasing complexity until it becomes stable or self-perpetuating as a climax community. The engine of succession is the impact of established organisms upon their own environments, and their relationship to both this and each other. In other words, interaction among species and within the environment are the drivers or restrictors of change in all ecosystems.

Thus, from a **leadership perspective,** time and positive interaction within structural and relational dynamics are compulsory variables for ecological and learning ecosystems to change and evolve. Thus, we must appreciate that substantial changes in the learning ecosystems affecting humans, organizations and communities will undoubtedly take months, years and in some instances decades to emerge. Rather than focus on absolute end goals, leadership's attention is redirected to the direction in which change is occuring, and to supporting the rate of change through intentional and relational processes. Taking into account the systemic and complexity nature of learning ecosystems, it becomes fuzzy to identify change enablers and restrictors from a linear logic, rather we prefer to frame these forces in the intersection between structural and relational dynamics and contextual disturbances. And within this intersection is where Ecosystems leaders can make the difference.

Structural and relational dynamics in the ecosystem refer to those intrinsic functions and energies through which an ecosystem claims to become healthy, self-regulating, self-sustaining, and capable of recovering from those external forces and alterations that cause cyclical disturbance. Thus, positive dynamics empower the ecosystem's regenerative capacity and enable its growth over time. These relational processes need to be intentional and sustained to allow for continual growth and change in structure and culture of the whole ecosystem. Flourishing learning ecosystems focus on the relational sources of energy and the regenerative capacity of groups, rather than only on the specifics of institutions, siloed resources, projects and outcomes. Technology serves to facilitate and strengthen these relational connections, as well as to provide greater visibility to system stakeholders of the other actors in the broader learning ecosystem. While system outcomes and approaches may need to change and evolve over time, and are subject to unexpected changes in internal or external conditions, attention to the development and the conscious facilitation of **relational fabric** supports the overall health of the learning ecosystem.
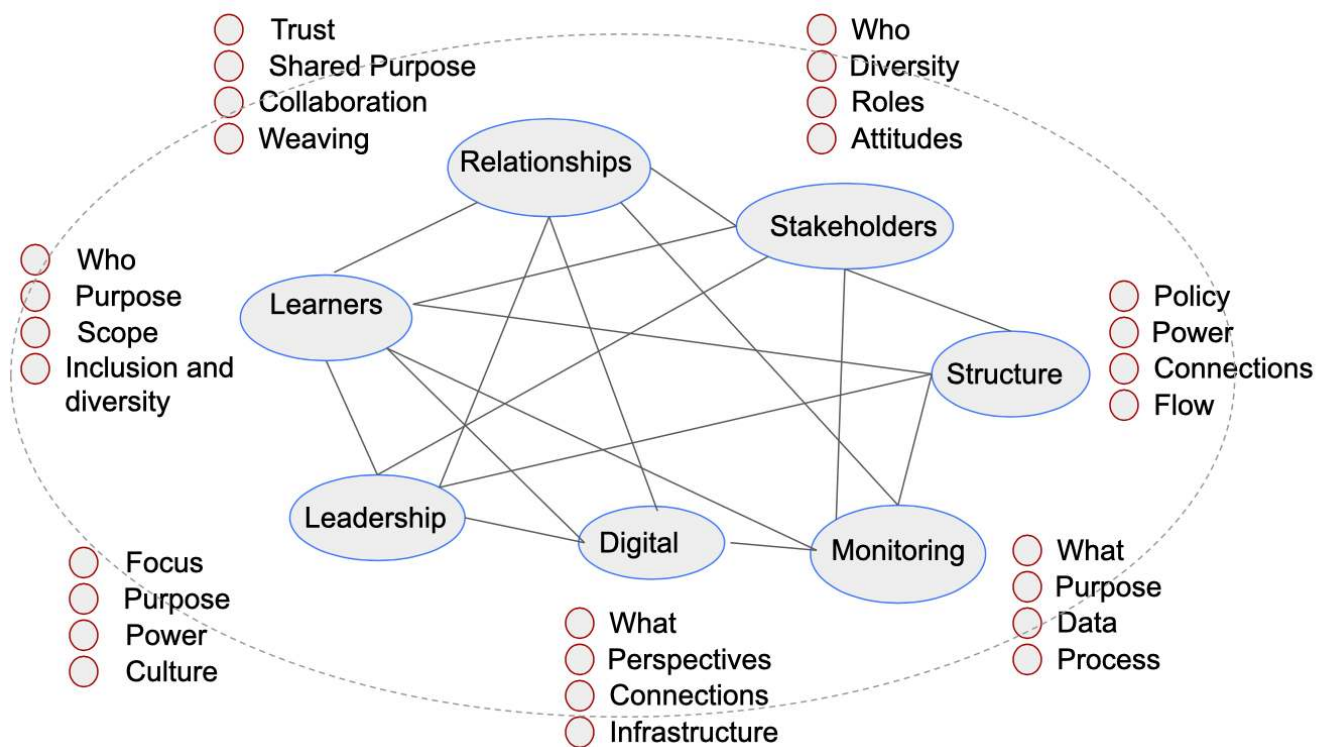

Figure 3: Evolutionary Framework Interdependencies

Therefore, purpose and focus within educational Leadership and Governance is crucial in the growth of Flourishing Learning Ecosystems. Leaders and decision makers from diverse levels of the system (macro, meso, micro) need a focus on fostering **structural and relational capacities** that sustain flourishing connections and relationships in the multiple learning ecosystem social networks. The challenge within complex, ever-evolving learning ecosystems is therefore not so much to identify a set common shared objective or Theory of Change which all stakeholders align with, as it is to enable system stakeholders to remain in a resilient and engaged relationship with one another, allowing them to move in complementary and responsive directions. Such engagement allows system stakeholders to recognise each other, think together, learn, innovate, prototype, and change together, despite the challenges, failures, and frustrations that they are certain to encounter. The capacity of the system to intentionally and progressively build structures that support these relational dynamics and assist stakeholders to remain engaged and in relationship, is essential in the evolution of a collaborative approach, shared understanding, and flourishing learning environment.

In addition to the recognition that positive relational approaches and dynamics can positively influence and accelerate the beneficial evolution of a learning ecosystem, it must also be appreciated that negative influences can impact or regress a learning ecosystem's non-linear evolution. Hence, an ecosystem's evolution is also impacted by the natural effects of Cyclical disturbances (Table 3), understood as a temporary change in environmental conditions that causes a pronounced disruptive change in an ecological and/or learning ecosystem. Disturbances often act quickly and with great effect, to alter the relational structures within the learning ecosystem. In the natural world, major ecological disturbances affecting ecosystems may include fires, flooding, storms, insect outbreaks and trampling, climate change, and the devastating effects of human impact on the environment. Similarly, major relational disturbances in learning ecosystems can be global health issues as the COVID-19 pandemic, regional conflicts, changes to laws and policies, lack of resources and austerity, drastic political changes, short term political vision, continuous changes in the government design for education and learning, or changes in leadership positions or roles, silo cultures and multiple resistances to collaboration, among others. Some of the identified cyclical disturbances likely to impact upon a learning ecosystem are reflected below.

Table 1: *Cyclical disturbances based on learning ecosystems contexts*

Type	Cyclical disturbances
Strategic decision making deficiencies	- Not enough explicit vision building - Lack of spokesperson for vulnerable stakeholders - Lack of neutral parties - Lack of diversity - Poor processes for agency & decision making - Lack of informed & available evidence
Organizational management deficiencies	- Poor management & governance structures - Poor role clarifications - Slow pace of change - Misaligned assessment - Lack of knowledge on how to provide consistency at scale - Outdated incentive structures /challenges - Low/ misaligned incentives and motivations
Resource deficiencies	- Lack of time, space & energy - Inflexible funding and lack of funding - Lack of sustainability and regeneration - Necessity of 'high profile' stakeholders to mobilise participation (lack of inherent social capital and stakeholder agency)
Structural support for collaboration deficiencies	- Poor collaboration processes & connection of services/stakeholders - Too much competition/punishment - Poor trust building exercises & activities

Adapted from Clayton, Amaral and Shafique (2022); Díaz-Gibson et al (2010).

Therefore, our work underlines the importance of seeding the relational dynamics in the evolution of flourishing learning ecosystems demands the emergence of key leadership roles that need to be present and sustained across the whole ecosystem. We identify two key leadership roles that fuel relational dynamics and influence the evolution of resilient and flourishing learning ecosystems: 1- First are **Ecosystem Orchestrators**, as explorers of deeper interconnections within the existing ecosystem, initiators of new interdisciplinary and intersectoral dialogues, and aligners of existing and potential stakeholder views, expectations and practices around holistic learning and SDG4 purposes. Orchestrators are skilled in the convening and facilitation of safe spaces, dialogic forums and platforms, reflective approaches and spaces, and creating the conditions within which learning ecosystems can grow and thrive. 2- Second are **Ecosystem Weavers**, as cultivators and 'gardeners' of intentional energy to recognise and introduce, hold space for, seed and facilitate seed trustful relationships between diverse people and organizations, facilitators of collaborative and innovative climates, and brokers of new relationships and synergies between people and organizations -from diverse sectors and disciplines-, and facilitating interconnecting existing policies and programs for a holistic and collaborative approach to learning and flourishing outcomes across the system.

Developmental Stages of Flourishing Learning Ecosystems: Emergent, Young, Mature and Climax.

1. Emergent

What is the Type of an Emergent Ecosystem?

Hierarchical, rigid and siloed systems. Restricted opportunities for development and change.

What are the characteristics of an Emergent Ecosystem?

Mainly formed by the formal educational system that is legislated in each country or region (this being the key stakeholders i.e. the educational ministry, other governmental and local agencies, primary and secondary schools, high schools and universities). Usually characterized by a rigid, siloed, transmissive and individualized organizational culture throughout the various component parts of the whole ecosystem. Such siloes result in a highly fragmented educational approach in the regions and cities. A clear hierarchy is present within the system and in the different levels of the administration. There is an evident disconnection between educational policies and programs and how education is experienced on the ground.

How is the digital system connected to an Emergent Ecosystem?

Stakeholders within the digital education and tech sectors in the region/country are typically not well connected into the formal education landscape, and have low levels of public funding, poor levels of private funding, and lack the appropriate environment to advance in their capacity to add value to the education sector. At this stage, innovative teachers are often the greatest asset for tech development as they tend to individually develop tech solutions for their educational practice and context, usually with little official support. Within such an emergent system, tech companies tend to remain apart from the ecosystem, and are perceived as external providers rather than as an integral component part of the system. In such instances, governments may often hire tech companies from other countries for the provision of ICT solutions and support in their own context.

What could be a simple and indicative example of a practice in an Emergent Ecosystem?

There is little to no change or evolution, and practices are implemented in disconnected silos. Schools within a specific city don't have strong relationships amongst themselves, and relationships between teachers from diverse schools are mainly informal and siloed. An example can be schools engaged on an adhoc and infrequent basis, such as 3 or 4 schools participating together in an annual Maths Olympiad.

2. Young

What is the Type of a Young Ecosystem?

Initial pockets of unrelated relational and collaborative activities start to emerge, challenging the system's rigidity and fragmentation. Experimentation with new outcomes that emerge from collaboration begin to be seen.

What are the characteristics of a Young Ecosystem?

Young ecosystems are already starting a process of opening the rigid boundaries of the educational system into initial relationships with external actors that are clearly aligned with the national education goals. These initial connections are mainly among formal educational stakeholders, but may also occur between formal education and non-formal educational stakeholders. This phase represents the beginning of a system's moving from considering schooling as the primary delivery agent for education towards an appreciation of a lifelong and lifewide learning approach. Depending on the region and context these natural and organic connections being formed may include multiple different stakeholders. At this stage, system orchestrators, cultivators and weavers start to emerge from diverse sectors, but such actors typically still don't have the funding and resources to sustain their ecosystem development practices. There is an acknowledgement of the need for the interconnection of policies and practices to support learning. At this point in the growth of a young learning ecosystem, it is typical for existing yet previously unconnected stakeholders to meet and start new conversations, sharing their goals and expectations, listening to and recognizing each other, and adjusting their approaches and styles of engagement as these valuable new relationships are woven. The relational dynamics initiated at this time will sustain the future development of the whole ecosystem of stakeholders, and will become the pillars that pave the way for a new relational infrastructure.

How is the digital system connected to a Young Ecosystem?

Local tech stakeholders start to be perceived as an important part of the ecosystem and are more likely to become external service providers to the system. Tech stakeholders increase their abilities to mobilize public and private funds. Frequently, an organic change in the system emerges from this increased recognition by the government of the role which tech companies can have in supporting education, resulting in tech startup companies starting to connect with universities and research institutions to collaborate. This allows for greater weaving together of tech capabilities and approaches with pedagogical knowledge and expertise. This usually gives rise to new educational tech startups and enhances future opportunities for their development.

What could be a simple and indicative example of a practice in a Young Ecosystem?

There is an initial move from considering schooling as the primary delivery agent for education towards an appreciation of a lifelong and lifewide learning approach. Pockets of ecosystem development activities such as sustained collaborations and shared projects start to appear but are disconnected from each other. An example of this might be a group of primary schools working together to improve the healthy living habits of their students and students' families. They are connected to share some initiatives, may partner with certain relevant external community stakeholders to support their efforts (eg healthcare clinics/ dieticians and psychologists), and they are able to share experiences and learnings.

3. Mature

What is the Type of a Mature Ecosystem?

Decentralized and flexible system emerging. Evidence of the evolution of relational structures, collaborative frameworks and cultures that accelerate change and development

What are the characteristics of a Mature Ecosystem?

Determined by the level of conscious exploration of new connections beyond existing educational silos. Education stakeholders search for new synergies with regional and city stakeholders across diverse disciplines, sectors and fields that play a role in learning. Such exploration and initial connections requires buy-in and the intentional allocation of resources and political support from the Government. At this stage, a significant number of influential stakeholders and leaders in the learning ecosystem become more experienced in breaking boundaries and silos, searching for new know-how and developing new collaborative cultures to sustain the new system. Weaving skills and roles start to be integrated into the leadership approaches used within the system. Political support, resources and efforts need to be increased to intentionally sustain orchestrator and weaver roles as ecosystem development accelerates. This is necessary to cultivate the relational foundations that will fuel the growth of the whole ecosystem: diversity, purpose alignment, connectedness, trust, and collaborative and innovative climates. At the same time, new strategies are sought to assess, understand and increase the impact of collective action. This is the point at which developing ecosystem synergies may be seen to generate clear benefits for their stakeholders, in line with their established objectives to improve learning outcomes. Progress towards the attainment of SDG 4 starts to be seen. The design and the structures enabling the development of the learning and digital education ecosystem need to be flexible enough to readjust over time to optimize resources, as well as to respond to the evolving needs and expectations of the different stakeholders involved. A flexible and iterative process for reflection and learning amongst the ecosystem partners is required. This allows for clarity to emerge on the adaptive approaches required to generate ongoing improvements in locally based education outcomes.

How is the digital system connected to a Mature Ecosystem?

Local tech companies are better supported by public and private funding, often through the development of tech accelerators and incubators. Physical environments in cities and regions start being designed and supported to create a tech ecosystem which is strongly connected to the learning ecosystem. Strong and fluent connections begin to develop between tech startups, tech companies, universities and research institutions, and the formal education sector, creating a cycle that favors the creation of new knowledge, attracts new funders and generates new startups. Simultaneously, strong connections are made to bring new technology solutions with a strong pedagogical background into schools and the wider learning ecosystem. Through this enhanced level of technological integration and support, the mature ecosystem develops a greater resilience to face contextual alterations and imbalances that might otherwise put the collective action emerging within the ecosystem at risk.

What could be a simple and indicative example of a practice in a Mature Ecosystem?

Attention and intention is paid to fuel the relational dynamics and better connect stakeholders around issues such as diversity, purpose alignment, connectedness, trust, collaborative and innovative climates, in order to fuel the growth of the whole ecosystem. An example can be a network of primary schools, secondary schools and out of school organizations working together to improve reading habits and literacy -both inside and outside the schools. EdTech is incorporated in these initiatives (for instance through a literacy app that provides online books and engaging pro-literacy activities).

4. Climax

What is the Type of a Climax Ecosystem?

Organic, resilient and nested systems that allow for new opportunities & change are present. These are sustained and grow over time as a sustained flow of information and energy between the component parts of the system occurs. Overall system functionality is progressively improved.

What are the characteristics of a Climax Ecosystem?

A climax ecosystem is able to support and stabilize an ecosystemic culture for the whole learning ecosystem, including a rich tech environment. New rules and new "ways of doing" based on collaboration, interdisciplinary dialogue and innovation are practiced at professional and institutional levels. In order to support this, policies are put into place to allow for intentional resource allocation and infrastructures that will ensure the climax ecosystem's sustainability.

Such policies actively support ecosystem orchestrators and diverse weaver roles, allowing for the establishment of intersectoral agreements. Policy frameworks coordinate documents across government departments and industry sectors, and allow for the participation of interdisciplinary actors in the education sector. These strategies are aimed to facilitate interaction between the diverse system actors to allow for self governed initiatives to develop within the ecosystem. The network organization within the ecosystem at this stage tends to be characterized by collaborative governance and distributed leadership. People and organizations are empowered to open new cycles of reflection, revision and regeneration in order to create new meaning and new opportunities for individuals and for the collective to further deliver on SDG4. Stakeholders within the system are able to perceive and appreciate the complexity of the education system dynamics, while simultaneously appreciating their specific role, and the connections of their role and work to other aspects of the system. Attention and effort is shifted away from purely specific outcome related activities, and towards the sustained flow of information and energy between the component parts of the system, such that overall system functionality is progressively improved. Lifelong, lifewide and lifedeep learning practices are embraced.

The term "climax" does not refer so much to a static "optimal" state, as it does to the capacity that is present within the system for continuous and emergent evolution, responsiveness to, and agility in engaging with and adapting to continuously changing circumstances, and the intentional maintenance of a high quality of engagement, communication and trust within the system to cope with deeply complex environments.

How is the digital system connected to a Climax Ecosystem?

The tech sector is able to attract public and private resources both to fuel the ecosystem and innovation environment, as well as to build and finance tech solutions that respond to the needs of the learning ecosystem. The learning ecosystem approach becomes increasingly attractive for tech funders, as they are able to engage in close proximity with multiple relevant stakeholders, and become part of a working culture which is well connected to, and highly responsive to, local context and culture. Tech solutions become progressively more capable of supporting the flow of information and connection between stakeholders, and develop the capacity to become inter-operable in how data is related between, within and to the component parts of the system.
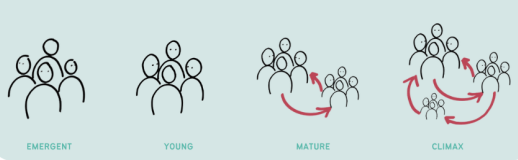
What could be a simple and indicative example of a practice in a Climax Ecosystem?

Interactions are sustained and continue in expansion. New rules and new "ways of doing", based on collaboration, multi- and metadisciplinary dialogue and innovation are practiced at all levels of the system, including professional, institutional and policy levels. An example can be a sustained and evolving alliance of schools, out of school organizations, universities, security forces, health organizations and sport facilities of a city working in a program to prevent drug abuse among youngsters. Digital technology supports the connection, flow of information, sharing of resources, and visualization of unique and specific outcomes achieved through the multiple and varied different activities and approaches used by partners.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

I.   **Dimension 1: Stakeholders**

EMERGENT   YOUNG   MATURE   CLIMAX

Evolutive Dimensions	Enablers	Guiding questions
1. Stakeholders People or organizations within the ecosystem that have an interest, implication and influence in education. 	DEFINITION	Who are the stakeholders that influence learning?
	DIVERSITY	What are the levels of diversity?
	ROLES	Who influences the learning ecosystem? What role do private sector and civil society stakeholders play?
	ATTITUDES	What are the general attitudes toward cross-stakeholder collaboration?

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 1: Definition
Guiding question: Who are the stakeholders that influence learning?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Formal education system, primarily public, is traditional, inflexible, compartmentalized, isolated and under-resourced.	Formal and Non-formal start to connect in more closely. Beyond public stakeholders, private and civil society start to interact and initiate new dialogues. Collaborations and network development between various stakeholders and activities starts to be seen, but these still lack interconnection.	In addition to formal education stakeholders and non-formal, private and civil society start to engage and collaborate more closely. Also, related education areas such as health, sports or cultural stakeholders are seen to play an important role in supporting learning and the attainment of SDG4. The role of orchestrators and weavers is intentionally sustained to connect stakeholders. Networks and collaborations from various system orchestrators and weavers emerge as a new relevant field in the ecosystem.	In addition to formal and informal education stakeholders, sectors and disciplines, the relevance of a broad range of societal and cross-sectoral stakeholders is seen in the ecosystem as crucial to the attainment of SDG4.. Ecosystem orchestrators and weavers, connectors, collaborators and allies are formally sustained and fueled. A sustained social field that transcends learning and embraces wellbeing develops.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Diversity
Guiding question: What are our levels of diversity?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Low or almost no diversity of stakeholders. Diversity is perceived as a threat	Diversity between stakeholders is emerging. This is supported as system orchestrators and weavers from a range of backgrounds start to engage and assume an informal connector role, even with very few resources . Diversity starts to be seen by some of the stakeholders less as a threat and more as an opportunity to explore. Expertise in managing diversity is relatively low, but new involvement processes are being discussed and planned, if not yet implemented.	There is maturing diversity among stakeholders. Diversity as an opportunity becomes an extended vision in the ecosystem. Orchestrators and weavers develop new expertise to manage and foster diversity. Diversity among stakeholders fuels further diversity of involvement, collaboration and innovation. Diversity involvement is a practice among many but not all ecosystem stakeholders. Some variation exists in what is regarded as the mission & vision of the learning ecosystem.	A highly matured level of diversity of both local and global stakeholders, including businesses, social movements and local and online communities. Diversity is seen as a crucial value for learning in the ecosystem. Orchestrators and weavers have experienced a growth in their abilities to positively manage and promote diversity, and play a central role in embracing this shared vision. The high levels of diversity allow for the greater value of the learning ecosystem for many different types of stakeholders. .

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Roles
Guiding question: Who influences the learning ecosystem? What role do private sector and civil society stakeholders play?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
RLIs (Recognized Learning Influencers) in the formal education sector (Primary and Secondary Schools, High Schools and Universities) are the only recognised educational actors. In some rare cases, novel learning solutions and their inventors are accepted as learning influencers. Due to the silo-effect, learning influencers have limited reach in the ecosystem. All potential learning influencers are not yet fully identified within the learning ecosystem. There is almost no stakeholder engagement with said learning influencers.	Some of the non-formal sector and civil society stakeholders (ex. leisure educators, after school teachers, coaches, facilitators etc.) are recognised as educators and learning influencers. There is still a lack of involvement of the private sector in the learning ecosystem. While there are pockets of interest based collaboration and network development, there is not yet a great deal of cross-activity/ interest or cross sectoral engagement occurring. There is growing level of engagement between stakeholders with specific interest or sector based focus - ie ECD/ Literacy/ Youth Development.	RLIs come from both the formal and non formal sectors, public, private and civil society, as well as from other connected disciplines such as health, digital, media, culture and others. Enhanced working relationships promote the evolution of the whole ecosystem. There are growing levels of diversity, mission & vision compatibility, interconnectedness, integrity, cooperative and innovative working environments. Private sector stakeholders start to see their role in actively contributing to shared learning purposes and SDG4, as funders, facilitators, educators, researchers, trainers, and other roles.	RLIs within the learning ecosystem come from all parts of society and the ecosystem, and are rapidly recognized by an inclusive ecosystem highly sensitised to creating lifelong and life-wide learning experiences. RLIs can easily connect to underscore their contribution to the shared purpose and SDG4, and engage in new dialogues with interested stakeholders. The private sector is collectively seen as a force for learning, and is closely connected to the ecosystem, finding agile ways and forms of dialogue and collaboration, and contributing to shared purpose and SDG4.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
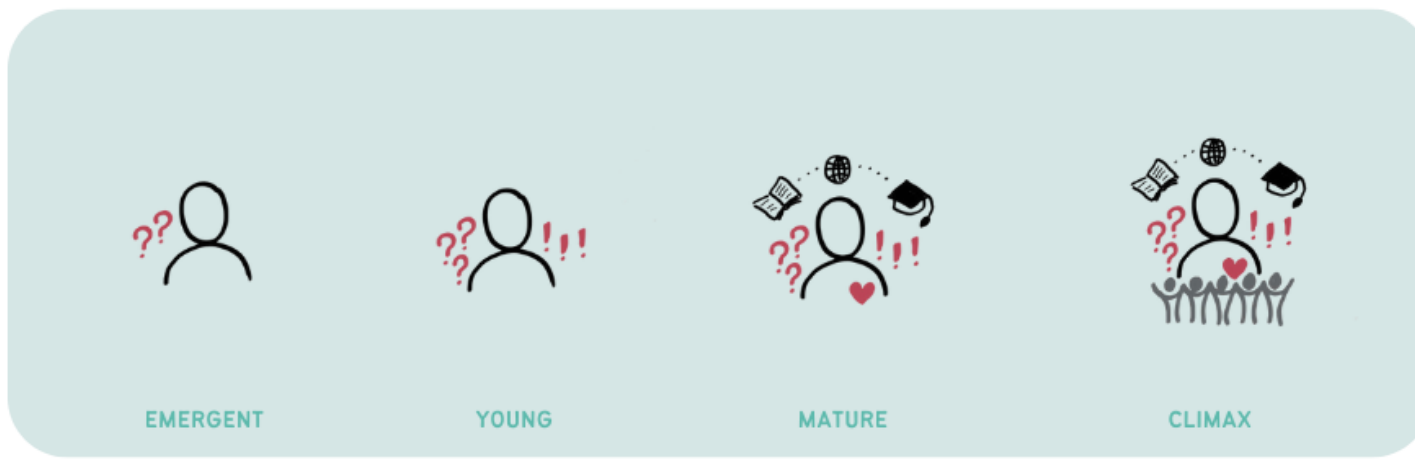
Enabler 4: Attitudes
Guiding question: What are the general attitudes toward cross-stakeholder collaboration?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
The "other" is seen as hostile, ignorant and disengaged within single, rigid, siloed ecosystems with no structures in place to facilitate engagement. Where parallel initiatives exist, there are low levels of engagement and dialogue between these subsystems, collaboration is perceived as an extra work to be done beyond professional demands and identified needs. Identified and/or engaged stakeholders focus on traditional services for the formal education system. Others remain separate from the learning ecosystem and are seen as disruptive outliers. Parallel alternative education structures may be actively repressed.	While the system remains disconnected, stakeholders are starting to activate and to open up to collaboration, as well as starting to engage with lifelong and lifewide learning approaches. Collaborative engagements amongst aligned learning stakeholders start to emerge, however these tend to be stand-alone activities and there is still a generalized lack of interconnection. Processes are perceived as time consuming and often are cancelled for stakeholders' lack of time and resources for collaboration. Given the increasing level of collaboration and diversity, there is a growing need for the coordination of policies and practices to support learning. Interest specific networks emerge (eg ECD, Literacy).	There is a progressively increased openness towards collaborative practices, but these are not fully interconnected.Working environments may still face bottlenecks around diversity involvement and trust. There is ongoing stakeholder engagement within the ecosystem, creating new opportunities and collaborations across the macro and meso levels of the ecosystem, and among various areas of expertise that influence learning. Needs for coordination and new connections are being identified and fulfilled, with new resources intentionally being assigned to lead these collaborative spaces and activities..	There is a sustained openness to collaboration and a commitment among stakeholders to cultivate an ecosystemic culture. New norms and new methods & processes, based upon communities of practice, multi- and metadisciplinary dialogue and innovation are implemented at all levels (including professional and institutional levels). Stakeholder collaboration continuously augments, expands, and evolves together with the learning ecosystem. Policy frameworks support and enable ecosystem evolution. There are few or no prejudicial relationships between sectors and disciplines. High levels of collaboration between public and private stakeholders belonging to both formal, and informal sectors (i.e. arts and cultural organizations, libraries etc…) are supported through intentional ecosystem infrastructures and approaches.

II. Dimension 2: Learners

| EMERGENT | YOUNG | MATURE | CLIMAX |

Evolutive Dimensions	Enablers	Guiding questions
2. Learners All the people that can gain knowledge, skills, competences, values, etc. throughout their lives and across spaces. 	DEFINITION	Who are the learners within the ecosystem?
	PURPOSE	What is the purpose of learning?
	SCOPE	What is the scope of the learning taking place (including curriculum, skills, wellbeing, life-long, lifewide), and where does learning take place?
	INCLUSION AND EQUITY	To what extent does the ecosystem promote inclusion and equity?

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 1: Definition
Guiding question: Who are the learners within the ecosystem?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Education and learning is considered to be focused primarily or entirely on children and youth. Very little attention is paid to adult education. Education environments are contained within physical or boundaried structures in the primary, secondary and tertiary levels of education.	Learners are starting to be seen as lifelong learners within the primary, secondary, tertiary education settings, including adult and older adult education. There is still generally a strong focus on children and youth learning.	Learners are viewed as humans of all ages involved in a journey of lifelong and life wide learning (school education, after school education, leisure education, artistic education, family education, etc.). Professional learning within institutions is seen to be relevant.	Learners are humans of all ages that experience a dynamic process of lifelong, life-wide learning, and life-deep learning that is comprehensive, holistic, full, meaningful, critical and transformative. Organizations (such as schools, administrations or businesses) are also themselves regarded as collective entities that learn and evolve over time.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Purpose
Guiding question: What is the purpose of learning?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Learning is perceived as an individual process that is highly standardized and competitive. It is seen as a separate or preparatory activity for life, and is accordingly separated from other areas of lived experience. Based on memorization, literacy and math.	Learning is perceived as amostly individual process, and is fairly standardized Collaborative and shared learning is appreciated and valued, but it is still experienced in silos. Increasing levels of recognition that learning continues and is necessary throughout life. Increasing level of insight into the fact that education needs to do more than impart knowledge and information, that knowledge and information are now widely accessible, and that learning requires an increased ability to access, interpret and continuously engage with sources of knowledge.	Learning is perceived as a personalized experience, oriented to collaboration. Deeper focus on emotional and holistic learning. Increasing level of recognition that learning opportunities are not only vertical, but horizontal too. Initial sense of the need to connect individual, collective and planet wellbeing. There is a recognition of the enhanced and expanded opportunities for widely diverse learning opportunities that technology provides access to. Multiple pathways to accessing learning are recognised.	Learning is perceived as a personalized and collective experience interwoven with wellbeing. Increasing awareness of the need to integrate learning, understanding, mastery and creativity into the holistic learning and development of the human being - not only as a child, but as a life-long process. Digital learning ecosystem provides increasing access and pathways to learning opportunities. Learning for individual, collective and planet wellbeing, and learning for common good.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Scope
Guiding question: What is the scope of the learning taking place (including curriculum, skills, wellbeing, life-long, lifewide and where does learning take place)?
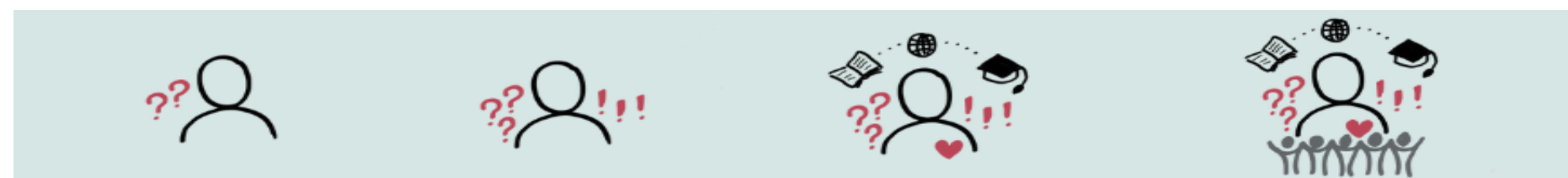
Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
The primary scope of learning are scholastic or academic skills and core competencies based on literacy and math. School is the unique/ only institution where this foundational learning takes place. The curriculum is standardized and siloed into subject divisions of learning, there is little cross-referencing between them (math, language, arts), and is organized in a limited number of pre-set trajectories. Schools support unidirectional transmission of learning and education from teacher (expert) to learner (recipient). Little exploration of subject matter outside of that which is prescribed. In some instances, lesson plans may be scripted and tightly controlled from a content perspective. The use of digital learning is structured according to the same curriculum trajectories outlined by the formal system with topic constrained access to digital learning tools.	Prevailing scholastic/academic skills and core competencies orientation that are organized in clearly delineated but somewhat expanded numbers of preset trajectories. School is the primary institution where learning takes place, but initial recognition to other learning spaces and expanded learning competences and opportunities are emerging- all perceived as school complementary. The curriculum is standardized but some cross-over referencing of learning topics and fields occurs, Cross subject planning, openness to problem based and real-life competences, are seen, as is the recognition of different learning styles and capabilities. There is increasing use of digital tools for expanded learning, cross-referencing, self-researching and exploration of related and aligned learning materials.	Scholastic and academic skills and core competencies are aligned with a life skills orientation. Appreciation of and effort to incorporate higher order critical thinking into learning models. School begins to experience a loss of learning control and is being reimagined as a learning community hub that intends to connect learning across local and global communities where learners reside. The curriculum offers increasing levels of integration of learning fields and subjects, connected to emotional learning and lived experiences, with an expanded curriculum taught by different education agents and understood as a personalized learning journey. Increasing levels of autonomous learning and discovery, such as project-based learning are supported, enhanced and further activated by access to an increasingly broad scope of digital tools. There is budding recognition and support of learner agency and personalized learning approaches. Group learning, divergent thinking and discussion are encouraged.	Core competency, life skills, emotional learning and critical creative competencies (higher order thinking, feeling and metacognition) orientated. The learning modalities are increasingly attuned to learner capabilities, interests and personalized learning journeys. School boundaries are diffuse, but schools are a highly relevant part of a wider network of stakeholders that influence learning, and become learning brokers and facilitators that guide personalized and collective learning journeys. Alternative learning spaces are recognized and actively cultivated within broader society. All social and community experiences are regarded as having potential for learning, and stakeholders share responsibility as learning enablers and participate in evaluation. The curriculum is organic -connecting relevant learning from school, communities and life-, dynamic -experimental and continuously changing and adapting- and holistic -pays attention to critical skills such as critical thinking, collaboration, communication, creativity, citizenship/culture, emotional education, and character education/connectivity. The learning processes are guided by educators from school and the rest of the community, and they are based on real problems and projects. Digital tools support critical competences and deep learning, such as the extended learning and the interconnection of experiences.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
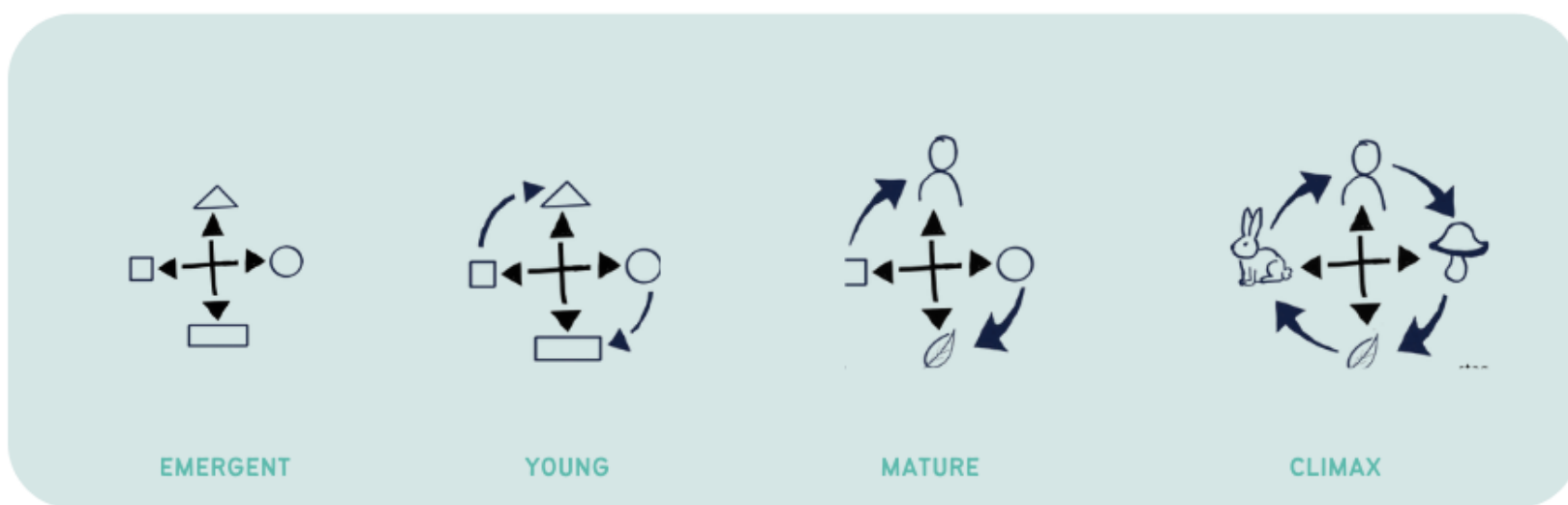
Enabler 4: Inclusion and Equity
Guiding question: To what extent does the ecosystem promote inclusion and equity?
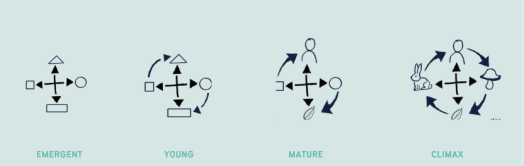

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Highly standardized and non inclusive approach. Vulnerable populations may be excluded with varying levels of severity. Learners with different learning capabilities beyond academic competencies may be also excluded.	Standardized approach with increased awareness of vulnerable and excluded populations. Early mandated practices to enhance and facilitate inclusion. Tend to be directed at obvious and easily identified vulnerable population groups.	Evidence of advancing towards a personalized approach that promotes inclusive and equitable practices to reach all of the target population. School and learning stakeholders show an increasing awareness of the need to create accessible and meaningful pathways to engage with opportunities from the learning ecosystem. Diverse spaces and interests outside and alongside the formal education sector offer valuable and inclusive learning opportunities. There is a developing appreciation of the value of diversity and exposure to differing lived experiences and views. Early appreciation of the richness of perspective and insight that diversity brings, leading to enhanced willingness to practice inclusivity.	Personalized, equitable and inclusive approach shared by the learning ecosystem and sustained by legislation. Multiple diversities recognized, accepted and welcomed with appreciation that not all diversities are visible, obvious or named. Inclusive and equitable practices seek to guarantee that all the target population is reached. Differing life experiences, opinions, aptitudes and capabilities are celebrated as opportunities for learning and creativity. The foundational humanity of all participants in the learning ecosystem is emphasized with increasing value being given to commonalities rather than to differences. Active efforts are made towards deepened awareness, connection, understanding and integration. There is a deep level of recognition of the richness and diversity of thought and experience brought by inclusion.

III.   Dimension 3: Structure

Evolutive Dimensions	Enablers	Guiding questions
3. Structure Structural fabric & policy elements of a learning ecosystem that enables it to evolve. 	POLICY & DEVELOPMENT FRAMEWORK	How do laws and policies influence ecosystem development?
	POWER	Who controls power and decision making? What is the role of the school in the ecosystem? How is decision-making devolved to the smallest unit of change?
	CONNECTIONS	How connected are the formal and informal education spaces? How connected are the public, private and civil society sectors that support learning? How connected is the educational system to other systems such as health, culture, sports, wellbeing...? How connected are the different levels of the ecosystem (macro/meso/micro?)
	RESOURCE FLOW	What are the structures and pathways that have been intentionally designed for the exchange of resources between stakeholders? (communication, tools, ...)

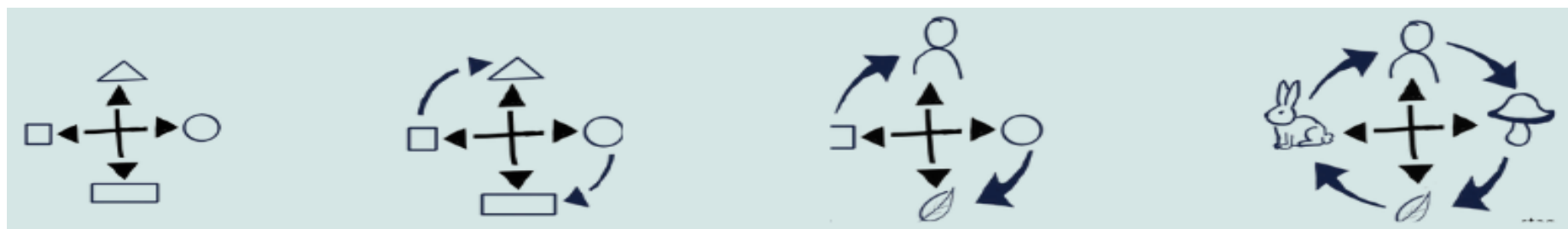**5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS**

Enabler 1: Policy and development framework
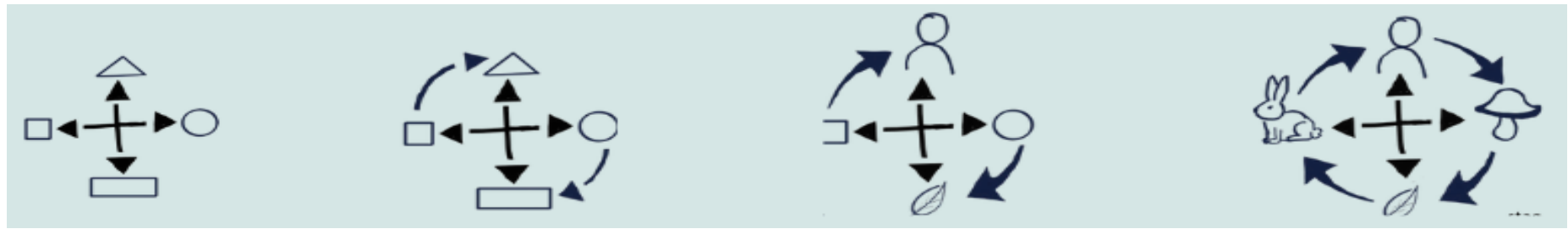**Guiding question:** How do laws and policies influence ecosystem development?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
"Dependence" model of development. Siloed, contradicting and disabling laws and policies that are only addressed to specific sectors (i.e. educational sector, social sector, cultural sector,...). This kind of policy environment creates turbulence and inhibits synergistic progression across the whole learning ecosystem. Novel initiatives tend to be dependent upon individual and occasional activities/ projects with little macro-level support or oversight. Such initiatives may be regarded as "breaking the rules" and those who undertake them may feel themselves to be activists, or may be seen as working in opposition to the system. Initiative or alternative ways of approaching issues may be met with a punitive response.	"Independence" model of development. Some joint agreements/policies involving 2 or more sectors (i.e. educational and cultural, educational and health) or different levels of the system (meso and micro) to support learning. Linked systems that allow dialogue and alignment of policy frameworks on a case-by-case basis, and in response to specific issues. Over time a growing awareness may develop of the complementary and reciprocal nature of two or more closely aligned policy areas, with the development of more structured and intentional opportunities for shared policy framework development. Pockets of innovation begin to develop with certain components of the education system seen as innovation spaces which have the freedom to experiment with new approaches to learning and teaching (for instance the private sector or NGO/ civil society spaces). While innovation spaces may confer/ collaborate with one another, this is not consciously pursued.	"Co-dependence" model of development. Quite a number of intersectoral agreements/policies to support learning are in place. There is increasing awareness of interconnected systems and interlinkages between policy framework areas and different levels of the system (macro-meso-micro), so as an ongoing policy dialogue between levels of public administration. Policy development considers other related structures and policies with multiple sectors recognized as being interrelated and with these being included in framework development. There is a recognition of the potential for high reciprocity and learning to occur between the formal education system and those spaces in which experimentation and innovation is taking place. The formal system starts to actively seek to learn from such environments. Some attention starts to be paid to bringing in system orchestrators, conveners and weavers to facilitate communication and relationship between multiple players. In the early stages, activities may be driven and funded by those sitting outside the formal education system (business, multi-national funders, donors and philanthropy) but as time progresses, shared activities start to be planned and driven collectively.	"Interdependence" model of development with widespread occurrence of intersectoral agreements/policies to support learning and sustainable policy dialogues between public administration levels. Consultative and integrative approaches are taken to the development of policy frameworks, with high awareness of the impact of and ramifications upon other parts of the system. Intentional spaces for dialogue, the development of insight, understanding, brainstorming and co-creative processes are held - not only at the times of policy review, but as a consistent and regular approach. This enables responsiveness to changes in the external environment or to new information received. External feedback and contributions from broad stakeholder groupings are actively sought, and policy decisions become progressively transparent and shared.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Power
Guiding question: Who controls power and decision making? What is the role of the school in the ecosystem? How is decision-making devolved to the smallest unit of change?
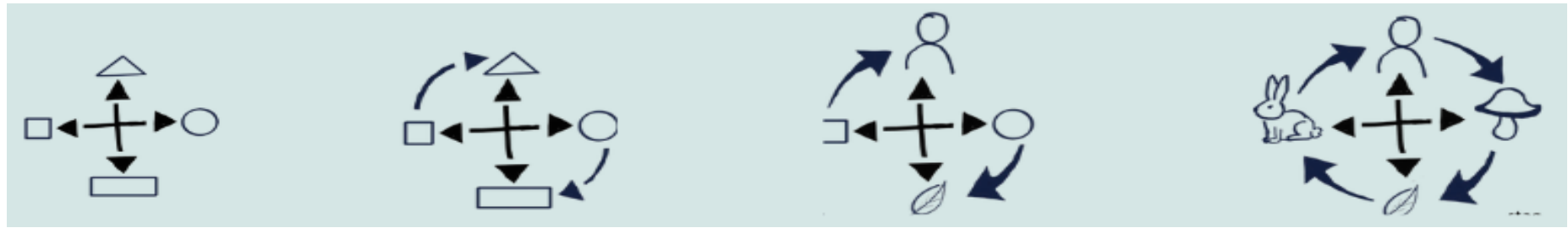
Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Primarily top down power dynamics. Stakeholders experience the system and each other as competitive, conflicting and stress-inducing. Where bottom up initiatives do occur, they may be regarded as subversive and suppressed. Disengagement between stakeholders within the hierarchy. School and formal education institutions are regarded as the sole recognized providers of education. Education and schooling are regarded as the same. Schools are regarded as specialist sites for the transmission of education and learning, and learners as passive recipients of existing knowledge.	Top-down and initial disruptive instances of bottom-up power dynamics. Stakeholders are in dialogue and are able to perceive their shared interests and co/inter-dependencies. Increasing numbers of bottom up initiatives towards improving education start to emerge. Disengagement between stakeholders within the hierarchy. School remains the main site of education. Learning starts to be conceived of as learner focused. Different realms of learning are recognized, as are different learner aptitudes and interests.	Top down and bottom up initiatives are present, as well as efforts to integrate these from the meso level (regional), creating greater visibility and engagement between macro (top/national) and micro (bottom/local) levels. Higher levels of facilitated, active discussions and intentional consultations among stakeholders start to occur. Consultative processes start to be valued, not only to share information on decisions already reached, but to glean input from related sectors during the decision-making process. Stakeholders begin to engage with one another and with the system level decision-makers. Schools start to connect more deeply and for the purpose of learning with other schools. Efforts are made to reach out across the different levels of the system. School works inter-professionally and horizontally (no/minimal hierarchy) with other educational agents (psychologists, social educators, leisure educators, cultural agents, teacher training colleges...). Schools start to connect more intentionally and meaningfully with key stakeholders (parents, community, business, extramural providers, health system).	Initiatives to support and improve learning may start in any part of the system (visibility of what is happening at the different layers of the system: micro - bottom up; meso -regional or macro- top down). Active communication channels allow for rapid dissemination and sense-making to occur in relation to the other parts of the system. Nested systems and inter-relational systems are more clearly visualized, articulated, and supported, and these are seen in relation to the whole. There are high degrees of engagement and shared purpose. Stakeholders make consensus-based decisions together. Multi-focal sites of decision making, project implementation and intentionally aligned projects start to occur. Schools see themselves and are recognized as learning brokers and innovation hubs within the learning ecosystem. They actively contribute to knowledge development and exhibit increasing levels of autonomy, agency and mastery that gets passed on to the learners. Schools promote clear pathways for communication between different stakeholders within the education ecosystem. They take on an ecosystem convening and convergence role. Schools also work interprofessional and horizontally (no hierarchy) with other educational agents (psychologists, social educators, leisure educators, cultural agents, teacher training colleges) and have opportunities to connect to all layers of the system.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Connections
Guiding question: How connected are the formal and informal education spaces? How connected are the public, private and civil society sectors that support learning? How connected is the educational system to other systems such as health, culture, sports, wellbeing...? How connected are the different levels of the ecosystem (macro/meso/micro)?
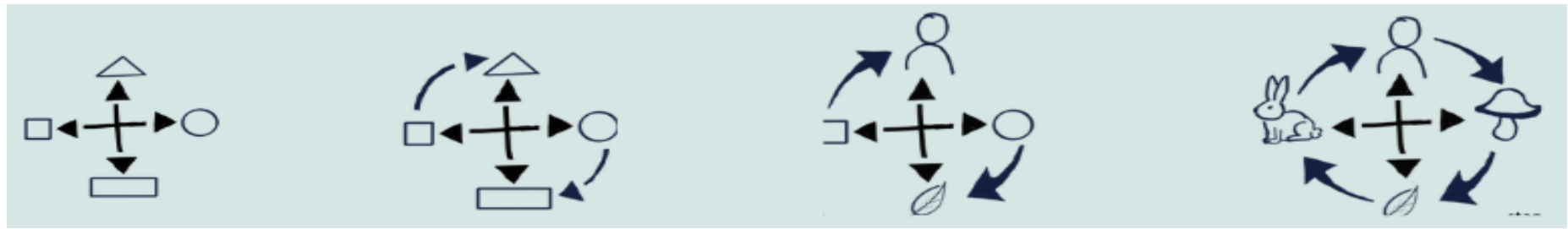

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Isolated system. The ecosystem is fragmented into small alliances and actors, without connection among layers (micro, meso, macro). There is poor communication between the different alliances and actors within the system, even within these layers. No or few systems exist to facilitate connection and communication between the different actors. Hierarchical power dynamics tend to further reduce trust and fragment connections.	Semi-connected system. The ecosystem starts to connect small alliances and interest groups through building networks, but without significant connection between the layers of the system (micro, meso, macro). Connections are mainly between formal and non-formal organizations. Increasing efforts are made to see where alignment is present, but may be easily frustrated. More effort is made to connect and support communication between the layers of the system. Communication of needs starts to emerge within each of the layers of the system (micro, meso and macro). Increasing numbers of advocacy and stakeholder networks align around specific interest points, focus areas, and/or collective projects.	Connected Systems. Increasing connectivity between learning and wellbeing, health, culture, sports, and so on., and between the layers (micro, meso, macro), starts to be intentionally facilitated. Public and private partnerships and collaboration starts to develop. Ecosystem facilitators begin to connect different actors and networks, and ecosystem infrastructure and practices further support this. There isn't yet a full awareness of all the potential actors and resources within the ecosystem, but there is an awareness that "we do not yet know what we do not know". There are some overlaps and some gaps that become apparent as connection starts to happen between the layers. A greater number of consultative and dialogic forums are generated. Early collaborative initiatives and projects start to take place between multi-party stakeholders. Funders start to actively fund and do research on the value of interconnected and collaborative approaches.	Nested Systems. The ecosystem enables increasingly deep levels of connection between different actors and networks through intentional facilitation, structures and practices. There is greater awareness of all the actors and resources (professionals, volunteers, programmes, facilities...) that make up the ecosystem. There are strong connections among layers (micro, meso, macro) with attention paid to looking for where the sources of energy, gaps, and blank areas are within the overall ecosystem, and to actively seeking out additional stakeholders relevant to the system. Attention is also placed on supporting the *conditions* for collaboration and co-creation, and enhancing levels of connection, trust and relational pathways, rather than simply on the collaborative projects themselves.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
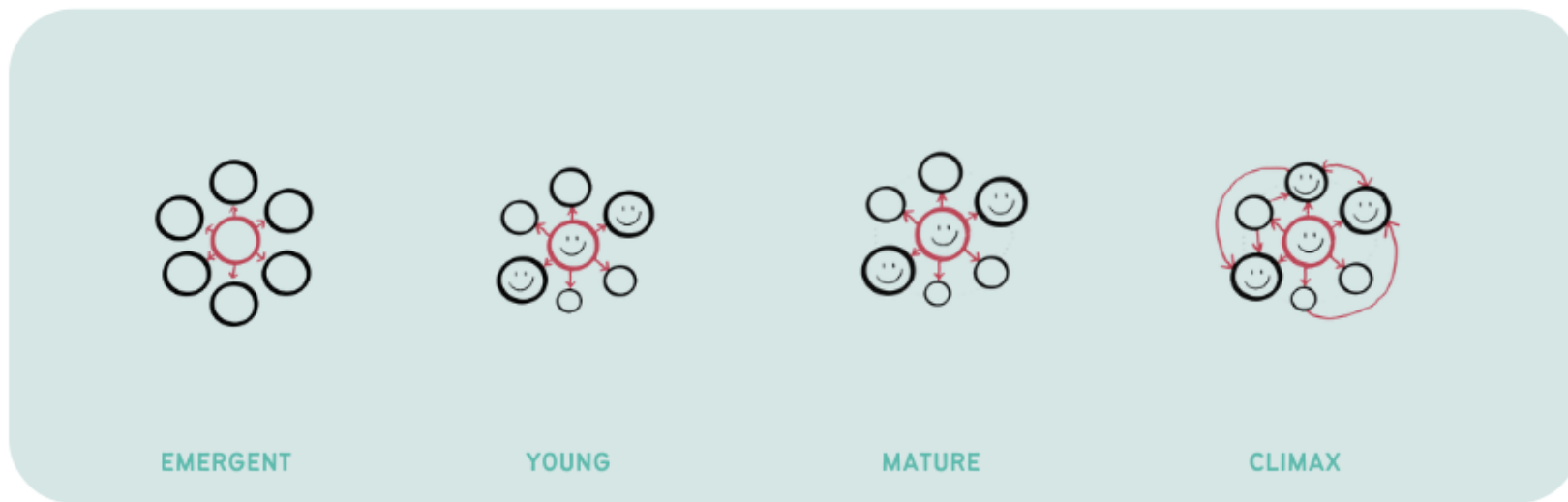
Enabler 4: Resource flow
Guiding question: What are the structures and pathways that have been intentionally designed for the exchange of resources between stakeholders?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Knowledge and resource development is siloed within departments or organizations, and sharing is protected and secretive. Where knowledge and resources are shared, this is often governed by a legalistic framework (non-disclosure agreements). There is minimal / little sharing of expertise, experience and useful resources (Super-specialised knowledge). There is a predominance of transmissive (unidirectional) resource flow, that is often delinked from real needs on the ground. Competitive & conflicting stakeholders operate in predominantly hierarchical styles. Information and instruction are the main resources shared. Delivery of resources tends to be disjointed, siloed, unidirectional and uniform. "Scaling" of mandated resource use is valued (eg a Centralised curriculum, single-source uniform textbooks, mass training and development approaches derived from a single centralized source). Use of resources belonging to the school may occur as add-ons to the received resources, but these are not encouraged and may draw censure if they are perceived by centralized structures as being contradictory to the mandated resources. Individuals and groups who succeed in their use of mandated resources are protective of their success and disinclined to share knowledge. The flow of information tends to be upward, the flow of instruction tends to be downward, with little sharing happening across different levels of the system (macro, meso, micro).	Information, knowledge and learning are the main resources shared, although they still occur within organizational boundaries. There is an evident need of communication between and among stakeholders in the ecosystem beyond legal frameworks. Unidirectional exchange is challenged by the need for mutual learning and exchange. Early communities of practice for educators within and possibly between schools emerge. Stakeholders remain concerned that they may lose competitive advantage by sharing information and resources with others, specially with external organizations. School starts to recognise the need to share information and knowledge with external stakeholders that impact on learning outcomes as parents, external after school and extramural activities, local health, business etc. Some level of engagement between clusters of neighboring schools occurs. Sharing of knowledge and resources is becoming more common.	Information, knowledge, data generation, learning, projects/activities are the main resources shared. Also, advice, emotional and learning support are present in the exchange flow between professionals. Common practices for disseminating information and resources include open-use sources vehicles such as Open Source and Creative Commons Licencing. Schools and education institutions start to identify themselves within clusters, and actively seek out diverse and divergent professional learning opportunities. Learning and professional networks are actively functioning with institutional support. Time and human resources are invested to facilitate active communication. Spaces for informal exchange and communication become of great interest. Exchange opportunities for both educators and learners start to be actively facilitated. New digital tools are searched and developed to foster communication, transparency and resource exchange.	Dynamic and optimal flow of information, knowledge, expertise, emotional and learning advice is increasingly apparent. Information, knowledge, action research, data generation, learning, projects/action are shared. Maps of community resources are used for educational purposes. Practices for sharing and disseminating learning materials and resources include open source and blockchain, and foster transparency. Digital tools are shared for facilitating communication and exchange of digital materials. Stakeholders use these communicative channels, processes and tools to develop a strong focus on trust, relationality and the ability to collaborate. These capabilities are viewed as non-tangible but powerful resources within the system. Innovations begin to emerge that are new and co-creative. Such innovations emerge from the insights gained through dialogue, interaction and an increasing awareness of the needs of the system. There are greater levels of agency, autonomy and trust in delivering the shared outcomes, and these dynamics increase the capacity to share and exchange new resources feeding a nutritive cycle.

IV.   Dimension 4: Relational Dynamics

| EMERGENT | YOUNG | MATURE | CLIMAX |

Evolutive Dimensions	Enablers	Guiding questions
4. Relational Dynamics Social and cohesive outcomes that develop the relational fabric and resilience in the ecosystem EMERGENT YOUNG MATURE CLIMAX	SHARED PURPOSE	How much shared purpose and sense of belonging is felt and experienced by stakeholders?
	TRUST	How much trust is felt and experienced by stakeholders? (interest and investment in each other's work, caring, safety, reciprocity...)
	COLLABORATION	To what extent does stakeholder interaction occur within a collaborative environment? (school, stages, between systems...and evolving) To what degree does stakeholder interaction take place in a co-creative and innovative environment? (innovative climates, experimentation, ideation, implementation...)
	WEAVING	Who is cultivating and weaving the relational dynamics across the ecosystem? To what degree is this occurring? (moving from less to more intentionality in weaving, non-existent to existing roles, different levels at which this weaving is occurring)

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
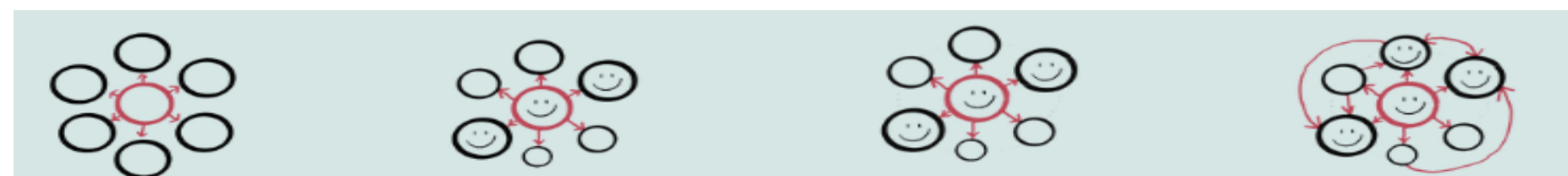
Enabler 1: Shared purpose
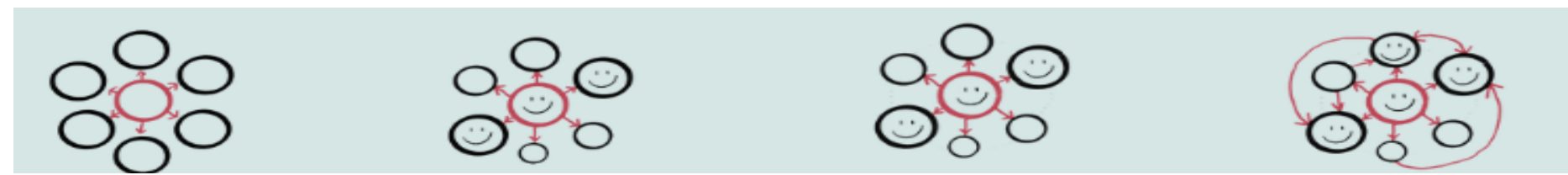**Guiding question:** How much shared purpose and sense of belonging is felt and experienced by stakeholders?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
The learning ecosystem does not perceive itself as a whole, and so a shared and extended learning vision and purpose are not perceived as relevant in the system. The formal education system is largely disconnected from extended stakeholders and to the needs of society and the economy, and is driven by its own goals, standards and practices. Different understandings exist amongst professionals as to what a learning ecosystem is. Universal primary and secondary education may be present in diverse forms of development and implementation. Sometimes early childhood development, universal pre-primary education and equitable access to technical/ vocational and higher education is present.	Low levels of shared purpose. There is an emerging sense of collective purpose within the formal system that does not include other stakeholders operating in the ecosystem. The education system is often disconnected from the needs of the society and economy, and is driven by its own standards and practices. There are different understandings among professionals of what a learning ecosystem is, however some initial effort is made to understand each other's perspective and view. Universal primary and secondary education including early childhood development and universal pre-primary education is present.Access to technical/ vocational and higher education is present in diverse forms of development and implementation.	Medium levels of shared purpose. There is an increasing awareness across all component parts of the system of an overarching shared purpose, broadly aligning with the objectives articulated through SDG 4. The education system is better connected to society and economic needs with focus on building a sense of community within the sector. A shared conceptual understanding of what a learning ecosystem is developed. Roles that facilitate this include: System orchestrators and weavers. These actors hold an increasingly important role in facilitating environments for the development of shared understanding and sense of belonging. The capacity to hold such weaving roles starts to be diffused into different parts of the learning ecosystem, and in so doing, becomes progressively more decentralized. These roles are seen as increasingly important within the learning ecosystem and people with these skills are actively sought out. Training on the attitudes, techniques and capacity to hold the roles of systems orchestrators, conveners and weavers is developed and shared within the system.	High levels of shared purpose and accountability are present. Formal and informal education and extended stakeholders in the learning ecosystem align around the objectives of SDG 4, feel that their goals are empowered by the broader ecosystem, have shared accountability, and experience that they belong and are integral parts of the ecosystems' growth and outcomes achievements. The learning ecosystem is strongly connected to dynamic societal and economic needs and focussed on building community both within and beyond the obvious system stakeholders. Increasingly, the needs of the learning ecosystem are seen as being strongly aligned with and connected to the needs of other policy sectors (e.g. health, social development, economic development). There is a shared conceptual comprehension of what the learning ecosystem comprises, and what its purpose is.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Trust
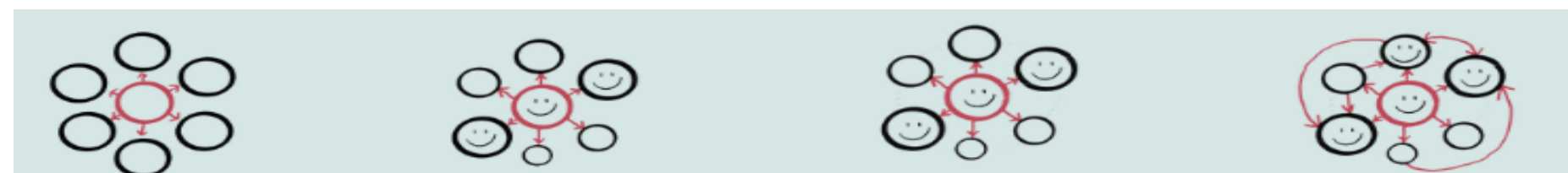**Guiding question:** How much safety and trust is felt and experienced by stakeholders?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Distrust among stakeholders dominates the system. Occasional instances of trust among some stakeholders who work in close proximity may occur. Low levels of attention are paid to fostering trusting relationships, or to the creation of environments for connection. The tendency is to be insular. Some disconnected groupings may form around common interests. There is a predominant sense of a lack of connection and insight within the learning ecosystem. There may be a fragile sense of psychological safety and belonging.	Some trust (though at relatively low levels) is developed. There is a recognition of the damage that trust deficit causes, and a desire expressed, at least amongst a majority percentage of stakeholders, to improve levels of trust and psychological safety. Early initiatives are undertaken to connect and strengthen trust between stakeholders. Greater levels of trust and "common in-group identity" develop between actors who share a common purpose or direction. Schools and organizations have reciprocal relationships with the communities that surround them. There is a perceived need to build a sense of shared purpose and alignment - mostly to enhance organizational effectiveness. Key decision makers show an increased willingness to create space for consultative participation in the learning ecosystem. While more effort is made to create opportunity for debate and consultation, such engagement may often seem adversarial.	Medium level of trust among stakeholders is present, with occasional high levels of trust and collaboration among some. As connection and insight into the thinking and work of other stakeholders starts to grow, new dialogues , and areas of common cause are found, and trust levels start to evolve. Early connections with aligned and complementary groups are sought and facilitated by stakeholders within the system. Trust continues to evolve in the medium term as stakeholders work with partners in the digital sector, and have increased numbers of opportunities to engage. Stakeholders feel safe and connected through a sense of belonging within the wider learning ecosystem. As the opportunities to connect with other stakeholders grow, the sense of where the boundaries of community lies expand. Early connections are made with more distant but relevant parts of the learning ecosystem. Cross-connections between stakeholders across sectors and disciplines start to amplify the sense of trust within the system. The deepening levels of relationship and connection make it easier to navigate the learning ecosystem, allowing for remote but meaningful connections to be accessed via the network of relationships and connections, and activating resource flow and exchange.	High levels of trust, reciprocity, inclusion, and respect exists among stakeholders. Conscious attention is paid to the creation of spaces which generate connection, safety, vulnerability, trust and deepening relationship. Focus is less on projects and work as the primary goals, and more on the quality of relationships within the learning ecosystem as the predictors for the generation of high quality and effective collaborations and projects (input rather than output focus). People experience acceptance of their being and belonging, and the connection of system stakeholders is seen as a purpose and objective within its own right, not simply as a means to an outcome. Safety, belonging and connection are actively and very intentionally fostered at and across multiple sites within the system. There is a strong sense of collective purpose and identity, and an understanding of the contributory nature of any work that is done within the learning ecosystem. Organizations and individuals actively support and advocate for one another's work. People show their vulnerability as trust expands and failure of a project is not seen as a reason to stop working together, but rather as an opportunity to deepen insight and understanding and to shift the approach taken to the project. Learners, educators, and education ministry officials are all viewed as contributors and active participants within the learning ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Collaboration
Guiding question: To what extent does stakeholder interaction occur within a collaborative environment? (school, stages, between systems...and evolving), To what degree does stakeholder interaction take place in a co-creative and innovative environment? (innovative climates, experimentation, ideation, implementation...)

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Siloed and individualized cultures predominate, favoring competitive and confrontational interactions. Specialized and separate expertises are present within the system. The hierarchical and standardized system has clear norms and rules that favor transactional and mechanistic interactions and relationships. There is an environment that favors the status quo with high resistances to change and evolution. Roles for connecting people and stakeholders in the ecosystem are not recognized. 'Win-lose' dynamics and competition is the dominant interactive paradigm, and the system tends to experience poor engagement from stakeholders. Participation tends to be compliance driven, and is mainly driven through information and instructions provided within hierarchical relationships. Mandatory participation predominates, and there are punitive consequences for non-participation. There is a perception amongst participants that their voices and opinions are not relevant and will not be listened to. The ecosystem environment facilitates interactions and experiences characterized by a lack of trust, shared purpose, flow of resources shared, interest in the activities of others, ownership, responsibility and autonomy, flexibility to innovate in order to modify resources for context	While siloed and individualized cultures still predominate, there are isolated collaborative networks emerging that activate the capacity for initial systems change and evolution. This enables an overlapping of disparate experiences, highlighting where niche expertises are present within the system, and enabling micro-environments in which collaboration and innovation start to flourish. Formal and informal relationships start to develop between schools, creating small networks that may struggle to be sustained over time, but succeed in creating new dialogues between different education stakeholders. Collaborative and innovative efforts are not intentionally favored by the system, and stakeholders leading these may experience a loss of energy and exhaustion. Generally, stakeholders remain concerned that collaborative work will detract from their focus and energy, impeding their ability to deliver on their own projects and objectives. Localized and isolated network groupings of stakeholders start to challenge the system. While system stakeholders express an interest in collaborative engagement and ecosystem development, they are disinclined / fearful to put these into practice, or may experiment with these approaches only within the confines of their own organizations, interest groups or sectors.	There is a co-existence between siloed cultures and network facilitation. The ecosystem starts to recognise the benefit of collaboration and innovation networks within the system in terms of goal achievement, resource effectiveness, connection to real needs, and stakeholder engagement, among others. Initial investment of intentional resources to support stakeholder engagement, collaboration and evolution is seen. Coordinated niches of expertise which are in communication with one another develop. School networks start to involve a variety of other formal, non formal or informal educational agents (i.e.families, universities, leisure educators, after school teachers, youth employment programmes...), within shared projects. Collaborative work and early co-creative work starts to be sustained over time. Networks of relationships tend to be more dense, continuous and sustainable. There is a consciousness of interdependence among educational actors that is translated into active discussion and more collaboration. Public-Private partnerships start to emerge as intentional ways to enhance opportunities for experimentation, learning and communication. Nevertheless, there may still be elements of competition and mistrust between partners. Attention is paid to alleviating the bottlenecks and disabling factors that reduce the efficacy and impact of innovations, including digital innovations. Individuals and groups becoming more selective and understanding about who they are aligned with, what level of engagement suits that relationship, and how closely they can or wish to work with each other. The quality of dialogue engaged in within and between networks improves, with stakeholders paying better attention to each other's perspectives, and consciously seeking shared meaning.	An ecosystemic and evolutive culture is predominant, with conscious of seeding deep collaboration, participatory and co-creative interactive spaces taking place. Collaboration & the strengthening of interactions between niche expertises becomes the norm. Learning networks encompasses formal, non-formal and informal stakeholders. The learning ecosystem network becomes more inclusive and grows in density and extension, with an ever-increasing awareness of the interdependence among actors. Stakeholders become committed to taking consensus-based decisions together, collaborative work becomes increasingly more effective, and is translated into the creation of shared projects, co-experimentation, and co-reflecting on past shared activities to configure further efforts at change and evolution. There is an increasing awareness of and visibility of gaps and blind spots within the learning ecosystem, and a willingness to identify and incorporate the stakeholders who are absent, not currently recognised by, or less involved in the learning ecosystem. There is an honest appreciation of human connection, high awareness of and visibility of the connections across the learning ecosystem, and a commitment to continually include and incorporate new stakeholders. There is a focus on reflective dialogues, and on learning from prior actions that have taken place within the learning ecosystem. Attention is given to further strengthening bonds and connections, deepening trust, and building a collective understanding of what is taking place within the learning ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
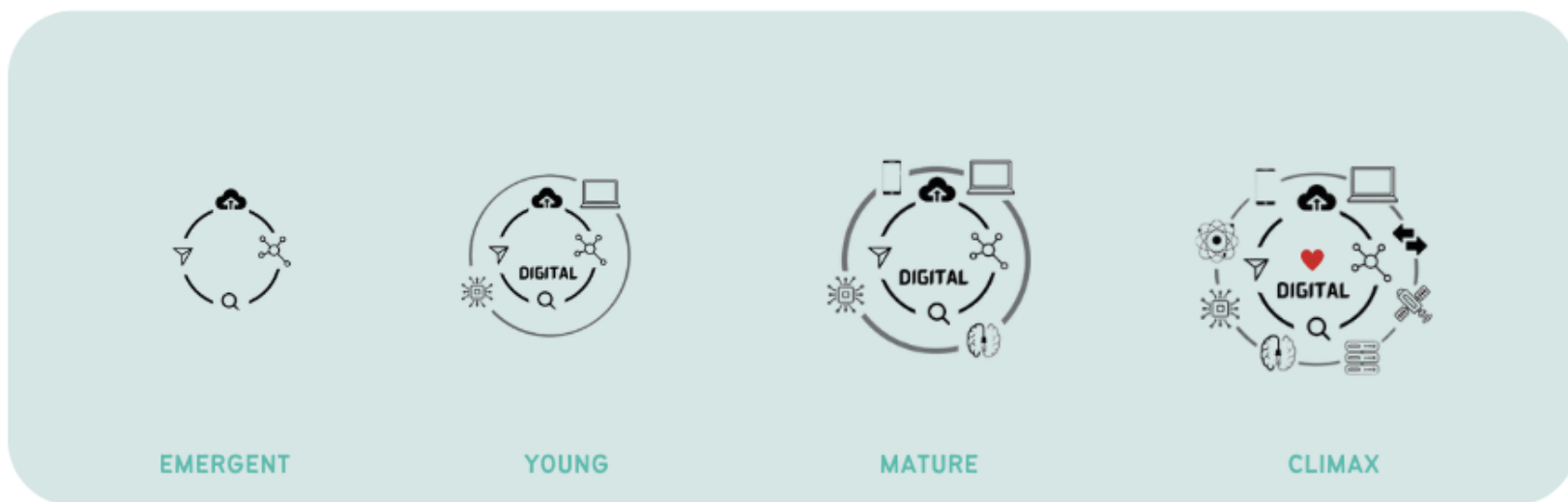
Enabler 4: Weaving

Guiding question: Who is cultivating and weaving all these relational dynamics across the ecosystem? To what degree and system levels is this occurring?
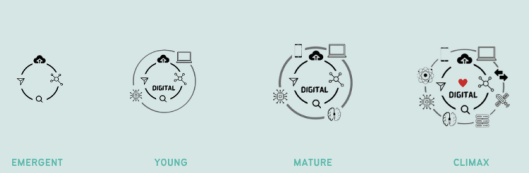

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Disconnected and competitive stakeholders operate in predominantly hierarchical / adversarial styles. Very little stakeholder orchestrating (coordination of stakeholders views and actions) and weaving (cultivating old and new purpose- based relationships) occurs. Where there are people who facilitate connection between individuals, groups or concepts, this is seen as "lucky", random or happenstance. Such individuals may have an inherent knack for spotting such connections, but they are formally employed in other roles. There is no formal recognition of weaving roles.	System orchestrators and weavers start to emerge and to advocate for and support coordination and collaboration. Such people may initially be regarded as impractical and idealistic. There are low levels of systemic support for these roles, however such actions are not actively shut down either, being cautiously observed and preserved by leaders in different parts of the system (mainly meso and micro levels). Some policy-makers, organization leaders, educators and other professionals in the ecosystem start to embrace these weaving practices, responding to the evident need of greater coordination of resources from what is already existing in the ground. Duplication of work,s and lack of action within needed areas, ignites a demand for more collective and coordinated actions. Increasing connection and collaboration (weaving) starts to develop within school or organizational environments. Some efforts are made to connect with the community around the school/ organization, with some coordination of activities between different schools and organizations within the same communities occurs. However, clarity is still lacking around who needs to do and fund this weaving work, and whether this is the role of public administration, independent civil society organizations, or is part of existing leaders' tasks.	System orchestrators and weavers are gaining experience and elevating the need for their approach and expertise within the ecosystem. They are starting to be funded and sought out to better connect existing networks and collaboratives within the ecosystem, but also to enable deeper levels of engagement, understanding and resource/knowledge sharing amongst increasingly more diverse stakeholders. The will to understand and gain deeper insight into each other's perspective develops. There is greater intentionality around the hosting and facilitation of dialogue. Weaving practices evolve and emerge as a source of deeper connection, interprofessional learning, shared purpose and co-creation. Innovative and effective projects start to emerge. Decision making and input forums are created where input from multiple stakeholders and voices can be gathered. Many nodes of influence have input into decision making, and are able to contribute to knowledge and resource levels. Although weaving is recognized and funded by the learning ecosystem, there is still the need to advance in this new field to better serve the ecosystem's purpose.	System orchestrators and weavers are regarded as an integral part of the system, and are embedded within it. Learning networks and training programmes to develop these roles and increase their presence within the learning ecosystem are designed and delivered as essential elements to support the system to further develop. Structures are established to allow for dialogue, contribution and iterative shared decision making. Attention is placed on supporting the conditions for collaboration and co-creation, and enhancing levels of connection, trust and relational pathways. Relational dynamics are recognized as fundamental for ecosystems' growth, decision making is iterative and agile, and allows for multiple inputs from diverse sources. Intentional sense-checking and alignment processes occur regularly, resulting in high levels of respect, trust and communication. Multiple innovative and diverse opportunities to further the purpose and objective of the system are sought and supported.

V.   Dimension 5: Digital Ecosystem

EMERGENT   YOUNG   MATURE   CLIMAX

Evolutive Dimensions	Enablers	Guiding questions
5. Digital and technological Learning Ecosystem Hybridization and connectedness of the digital and tech systems within the learning ecosystem. 	DEFINITION	What is a digital system and who are the digital and tech stakeholders?
	PERSPECTIVES	What is the educational system's view on technology? What is the tech stakeholders view on education and learning?
	INFRASTRUCTURE	What are the characteristics of the existing digital infrastructure? (level of establishment, services provided, safety, inclusion rural/urban, high-low income/intergenerational access and usage, funding).
	CONNECTION	What is the level of connection between the learning and the digital ecosystem? (engagement, resources shared, expertise) What level of shared knowledge/expertise and training is taking place?

LEARNING ECOSYSTEMS TRILOGY REPORT 1 EVOLUTIONARY FRAMEWORK.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 1: Definition
Guiding question: What is a digital system and who are the digital and tech stakeholders?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Technological networks are generally controlled by and composed of providers external to the education system. Tech originates from outside the education system through external providers which can be foreign companies with limited insight and applicability within the local learning ecosystem. Tech skills are regarded as specialized & separate expertises. Most of the expertise in the ecosystem is academic, i.e. largely theoretical. In general, with the exception of rare siloed cases, practical technology expertise does not interact with the academic systems and learning expertise. The digital learning ecosystem is linear, has "point-to-point" processes, centralized network processes that are cyclical visualizing processes. Digitalization in the educational system is also siloed and with very little dialogue between educational and digital expertises.	Local tech companies, who are typically supported by public and private funding, start to create a tech ecosystem which is better connected to the learning ecosystem, closely working with public administration, research institutions and universities. There is an emergence of formal incubation and acceleration structures for edtech and digital learning, which give rise to a formal spaces for dialogue and development of digital learning solutions that are better able respond to SDG4 goals. These spaces are often partnered with local Universities. Early forays are made by tech companies into a cross-sectoral approach to learning and SDG4. Digital learning opportunities in the territory may start to emerge in connection with real social and learning needs, new startups grow into the field. These are usually regarded as supplementary or complementary to the formal education system, and are not yet integrated into the system. Digital tools may start to be used to measure and connect successful learning innovations that are emerging.	Local tech companies which are typically supported by public and private funding create a tech ecosystem which is strongly connected to the learning ecosystem. Dialogue between learning and digital expertises is now sustained by the ecosystem and becoming a new norm. Formal incubation and acceleration structures for edtech and digital learning have become increasingly common, supported and nurtured by research institutions, public organizations and private companies interested in the growth of the learning and digital ecosystem in the region. Startups connected to SDG4 continue to emerge and grow, and new tech-learning businesses accommodate in the territory and become ecosystem energizers.	A rich tech environment is an integral part of the learning ecosystem. The digital ecosystem is composed of interconnected technological networks that enable coordinated practices throughout the learning ecosystem, and actively solve problems within the education system, with an "innovation" attitude. There is full governmental and policymaker support at a macro/strategic level for the integration of the digital ecosystem with the learning ecosystem that is sustaining the new collaborative culture. The digital ecosystem operates within an iterative cycle of innovation, thus supporting and enhancing a process of solving problems in the learning ecosystem and education system connected to SDG4. Iterative upwards spirals for improved impact and iterative change processes between the digital and the learning ecosystems are the norms in the ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Perspectives
Guiding question: What is the educational system's view on technology? What is the tech stakeholders view on education and learning?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Technological support is primarily in service of supporting the functioning of education systems and institutions, and supporting the existing set curriculum outcomes for schools. Technology companies are viewed as external 'service providers' to specific educational projects, rather than as integral contributors to the education landscape. Technology companies are frequently viewed as potentially harmful outsiders rather than as an internalized element of the learning ecosystem. Education and EdTech system innovators and technology company stakeholders remain apart from the learning ecosystem and are rejected as meaningful learning influencers. Digital learning ecosystems are not perceived as forming a part of the formal education structure, and digital solutions are at best included only in order to achieve the existing goals of the formal education, but have limited ability to influence the scope of or approach to the delivery of learning.	The leaders of the education system may respond with suspicion or feel threatened by digital innovations, however may also be willing to adopt successful new practices if these are substantively proven and advocated for. Technology and the digital learning ecosystem are seen as ways to expand scope of curriculum and augment formal learning opportunities. A digitalized world pushes education to better connect with technologies. Digital tools may also be seen as useful in visualizing and building up networks around schools and communicating with stakeholders. Education specific digital innovations start to be seen. Tech companies start to see learning and education as a highly interesting space to invest resources for development, but struggle to establish positive connections and synergies with the formal education system.	Digital tools are used to expand and enhance the opportunities for connection across learning contexts - sometimes even to different geographies, mediated by tech. The digital learning ecosystem starts to be increasingly valued for its capacity to deepen and widen learning opportunities. EdTech companies start to proliferate, and their potential to expand and extend learning opportunities is increasingly valued. It is seen as a viable option for achieving SDG4 and extending learning opportunities to rural, disadvantaged or dis-enfranchised communities - however there is frequently a lag in the provision of the technological infrastructure to allow these opportunities to be fully realized. There is increasing public investment in EdTech solutions for overcoming "wicked" educational and learning system problems.	The digital and learning ecosystems become "nested" within one another. Interlinked open digital systems allow for an increasingly free exchange of information between stakeholders, as well as for the opportunity to collaborate openly across micro, meso and macro levels within the learning ecosystem. The digital ecosystem sits both within and alongside the learning ecosystem and education system as a facilitator of strategic policy at the macro level. Information, energy and resources are distributed across the interlinked nested digital and learning ecosystems to all stakeholders. Technology increasingly facilitates connection, communication, mapping, visibility and the sharing of resources and knowledge across the learning ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Infrastructure
Guiding question: What are the characteristics of the existing digital infrastructure?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
There is a low level of tech impact on the learning ecosystem, with very little tech incubation at play. There is poor funding for EdTech initiatives. Where this is present, it is experimental and isolated within the learning ecosystem. Tech infrastructure within a country is limited and usually developed, structured and managed by private entities. Tech devices such as laptops or phones for connectivity and learning purposes are exclusively for those who can pay for them (not the majority of the population) and WIFI infrastructure is insufficient to cover low income suburban communities, rural areas and low income villages. Ed tech education in terms of safety and privacy is also limited and exclusive. Where standalone EdTech products do exist, these are not integrated into the education system or learning ecosystem, let alone any digital learning ecosystem. Data is managed in a siloed and boundaried way, with each stakeholder in the system having a repository of their own data in a relatively static form (e.g. lists, Excel Spreadsheets).	Some early public-private partnerships and corporate social investment initiatives are in place to increase the levels of tech infrastructure and tech education. Private entities continue to expand tech infrastructure, particularly where there is evidence of economic benefit. There is an intention of extending the WIFI infrastructure to poorly served, rural and disadvantaged communities, mainly led by NGOs (locals and internationals as UNICEF, UNESCO and others), but connectivity still is a matter of privilege. Technological devices become more accessible, less expensive and in greater demand. Initial concerns emerge on safety and data privacy. Data within specific organizations/ stakeholder sites becomes internally better connected, so that it is possible to visualize and understand the relationships between data sets within the same context/ organization. There is some tentative and early connection of data sets from different but related stakeholders (eg around interest groupings and areas of focus)	Increasing prevalence and acceleration of public-private partnerships and corporate social investment initiatives to increase tech infrastructure and access in poorly served, rural and disadvantaged communities. Government starts to become actively involved in mandating and directing tech infrastructure development. Private entities continue to expand tech infrastructure, and may be influenced in sites of development by government policies. Most of the population is connected to the WIFI network and has access to buy and use technology for communicative, learning, marketplace and leisure purposes. The system creates awareness around privacy and safety issues and most of the population is concerned and aware. Coordinated niches in communication between the digital and the learning ecosystems become common. Digital tools facilitate increasing levels of cross- and inter-sectoral communication. Communication becomes increasingly two way (dialogic) in nature. Substantive and increasingly meaningful and productive communication and cooperation between key digital and learning ecosystem stakeholders occurs, resulting in meaningful educational and edtech innovations. The usefulness of the digital learning space to support marginalized or disenfranchised learners is increasingly understood, although there may be a significant lag in the provision of the infrastructure needed to allow for such learners to access digital learning opportunities. Data is well connected within individual organizations, as well as across interest groups, and is able to be accessed in a way that is increasingly interoperable within specific interest/focus groupings (e.g. literacy or ECD subsectors). Early connections and sharing of data starts to occur with increasing frequency across the broader learning ecosystem. Early efforts at setting up interoperable data management systems are present.	The technology infrastructure catches up with the tools and potential that EdTech has to improve learning access to rural, disadvantaged and disenfranchised learning communities. The digital ecosystem is regarded as a key enabler and partner in the efforts to further strengthen and build the broader learning ecosystem, as well as to ""see beyond the current boundaries"" of the system. Educators, learners, parents and related learning partners are active users of the digital learning ecosystem. The digital learning ecosystem becomes progressively more integral to, supportive of, and valuable to the overall learning ecosystem. It is actively incorporated across all levels of the learning ecosystem to facilitate communication and engagement. The digital learning ecosystem is widely and voraciously used, not only to glean new information, but to connect with and experience other cultures, lived realities and relationships that fall outside of a learner's physical experience. Synthesis of the digital and human elements comprising learning ecosystems is actively sought and enabled. Strong focus by system stakeholders, including government, public private partnerships, and private entities in ensuring that technological infrastructure enables access to the digital learning ecosystem for all societal stakeholders (strongly inclusive approach to tech access). Data management becomes increasingly interoperable across the system, with increased visibility of what data present in different pockets of the learning ecosystem, as well as insight into how this data might relate to other areas of the learning ecosystem. Government and public private partnerships support and facilitate the intentional creation of a technical backbone (technical structure) which allows for data sets to be interlinked and to communicate with one another. High levels of interoperability are sought and are brought into play, while still respecting data ownership and self-sovereign identity.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 4: Connection
Guiding question: What is the level of connection between the learning and the digital ecosystem? What level of shared knowledge/expertise and training is taking place?
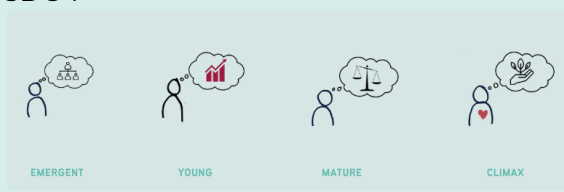

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Poor levels of connection. There is a very low development of the digital ecosystem due and siloed educational system, as well as a narrowly defined learning ecosystem. The digital space is disconnected and separated from the broader learning ecosystem. Passive engagement, 'sage on the stage'-style stakeholder dynamics govern the digital learning ecosystem. Digital services are seen as being in service to and under the authority of the decision makers and managers within the learning ecosystem. There is a lack of cross-system connection between the technological and the education systems, and poor flows of communication and engagement. Management of information within the digital ecosystem is based on competition and competitive advantage.	Initial efforts for connection. There is a recognition of the importance of digital systems in the learning environment, yet a lack of the structures neededto implement it well. Digital learning stakeholders' (edtech) influence in the learning ecosystem starts to emerge. The digital ecosystem starts to be perceived as a potential partner for achieving connection between stakeholders, as well as for offering access to resources that could further enhance learning and education objectives. The digital ecosystem starts to engage more frequently with the learning ecosystem - often due to the efforts and support of early system orchestrators and weavers. Such individuals usually convene stakeholders from the different systems on the basis of their personal connections with diverse stakeholders. These instances are not seen as routine or required, but as optional - even though they may be interesting and helpful. Digital networks start to create alliances and cross-sectoral connections into the education space, supporting the education sector on issues such as research, curriculum development etc. Information, energy and resources start to flow between some interconnected stakeholders in respective ecosystems - however in the main these are still siloed to these engaged stakeholder groups. There are still resisters and directly hostile stakeholders to tech within the learning ecosystem but there is an increasing awareness of these barriers and bottlenecks.	The digital ecosystem is growing in diversity and scope, with new opportunities for how technology and digital skills could support not only learning and education, but in fact also the further emergence of the learning ecosystem itself. Digital tools are increasingly used to facilitate connection across the ecosystem, and to access learning resources of value to the stakeholders. Stakeholders from the two spaces start to connect and collaborate more frequently, deepening trust and understanding between the sectors. A strong sense of sector identity and the potential for collaboration starts developing. The possibilities around blended learning opportunities are appreciated. Interoperability of mapping systems becomes increasingly prevalent, with the digital sector being called on to provide technological means to facilitate this. There is an increasing focus on the creation of digital platforms and learning environment spaces, on interoperability, and on open source information within the digital learning space. There are some coordinated niches in communication between the digital and the learning ecosystems. Digital tools are used for mapping of stakeholders and expertises within the learning ecosystem, as well as for communication between stakeholders. The communication is in most cases still one way and passive, such as news portals and newsletters from expert organizations within the learning ecosystem. Communication and collaboration on education initiatives and edtech opportunities starts to be seen between stakeholders in the digital and the learning ecosystems, effectively contributing to SDG4 achievement.	Digital systems are integrated in the wider learning ecosystem and play a key role in supporting the ongoing evolution and SDG4 achievement. The digital learning ecosystem is no longer identified as a separate part of the learning ecosystem, but is integrally incorporated. Collaboration and the development of shared niche expertises between digital ecosystem and learning ecosystem stakeholders become routine, with high levels of cross-over expertise developing. Expertise across and between both sectors is mapped using technological tools. Niche expertise is consciously developed through R&D projects with diverse stakeholders (I.e. on hot topics such as hybrid learning). Experts in the digital and learning ecosystem work together on theoretical, practical and applied issues. The digital ecosystem fosters collaboration amongst and between stakeholders with niche expertises within the digital ecosystem and the learning ecosystem. Technology is used to facilitate connection, expand access, and enhance learning opportunities. The digital and learning ecosystem increasingly merge to become a "digital learning ecosystem". Formal, non formal and informal sectors (media, health, culture etc.) are widely recognized as educators and/or learning stakeholders, and have also an influence on the digital learning ecosystem. The digital learning ecosystem is deepening and diversifying in its stakeholder engagement and representation, and is integrating both alternative digital and non-digital learnings into its development as a result of its exposure to a broad group of stakeholders. High levels of reflection and dialogue enable the personalisation and integration of learning experiences. Communication, shared information, connection and visibility of the learning ecosystem is facilitated by technological means. The human and digital elements of the learning ecosystem begin to work in harmony.

VI.   Dimension 6: Leadership

Evolutive Dimensions	Enablers	Guiding questions
6. Ecosystem's Leadership Energizing and co-shaping Structural and Relational dynamics for ecosystems' evolution and holistic achievement of SDG4 	PURPOSE	What is the purpose of leadership in the ecosystem? (expectations, authoritarian, individual, to distributed, resilient, relational, collaborative)
	FOCUS	What is the direction of power and energies? (from hierarchies to networks, to dialogue and generative co-creation amongst system stakeholders) What are the leadership roles and styles and who takes them?
	POWER REDISTRIBUTION	How is power redistributed by the leaders? How are decisions made in the system? (voices attended, disagreement, discussion, consensus)
	CULTURE	What are the leadership practices that you see in your system? How information is gathered and communicated? How are relationships facilitated? How autocratic/delegation/distribution and shared is the leadership in your system?

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 1: Purpose
Guiding question: What is the purpose of leadership in the ecosystem?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Hierarchical, feudalistic, authoritarian leadership focused on management, control and maintaining the status quo. Leadership roles are highly visible, status orientated, and relatively fixed. Rank and power predominate. There is great dependency on leadership to achieve results and all change in managed from the top down.	While a hierarchical leadership style is still evident, there is a shift to a more democratic style of leadership. This is evident in the shift from top-down management decision making, which is primarily focused on roles, responsibilities and is task focused into a more relational model, where attention to others' emotions and motivation matters and employee wellbeing becomes a consideration. Still operates in silos (schools, universities, business, ministries, and so on) with a lack of systems perspective. A greater awareness of a trauma-informed process is beginning.	Collaborative leadership is present. Team members are active participants in the decision-making process and cross functional teams are present. Leadership demonstrates appreciation of the interdependent nature of the work done and recognise the need for a shared vision to enable synergy between teams. As systems thinking develops so does the leaders recognition of the need to work collaboratively. The need for synergy within interconnected systems emerges. Distributive leadership practices are evident. Wellbeing practices are increasingly prioritised within the education system, with leadership paying particular attention to them.	Transformational leadership emerging. Holacratic structures evident - i.e. leadership progressively becomes decentralised. Leadership becomes a collective exercise in which the process of sense-checking and sense making is increasingly collective in nature. As trust builds leadership is relational in nature and devolved decision making becomes increasingly predominant. Based on empowerment. The ability for dispersed and distributed leadership increases within the learning ecosystem. Awareness of self-regulating equity-based ecosystems needs to evolve. Wellbeing practices are integrally incorporated and increasingly recognised as being fundamental to the capacity to learn. Leadership pays intentional and focussed attention to the creation of environments within which human wellbeing is attended to, and stakeholders can thrive.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Focus
Guiding question: What is the direction of power and energies? What are the leadership roles and styles and who takes them?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Leadership influence is unidirectional and downward into the hierarchical structure. Leadership roles are highly visible, status orientated, and relatively fixed. It is autocratic, unidimensional, and singular. Leadership focus is on the delivery of specific outcomes and objectives, which have usually been set beforehand and have fairly strict/ constrained parameters. Attention and decision making tends to be outwardly focussed onto the system.	Leadership focus is on making better quality and more effective decisions, but this decision-making process remains centralized and fairly rigid. Attention is paid to improving compliance and delivery on decisions through improved engagement with structures required to deliver on decisions (training workshops, information sessions etc), however focus is on getting people to deliver on decisions made rather than to contribute to how they are made. Leadership creates space for an increasing level of debate and sharing of perspectives - primarily to inform better decision making. Team-focused. Team and team leaders facilitate communication but along fairly rigid channels. Orchestrating and weaving are not yet in the leadership focus.	Leadership focus becomes increasingly about developing agility and flexibility in terms of both the decision-making process, and how outcomes on this are delivered. Deeper strategic focus in the ecosystem and connection of systemic elements. Higher levels of communication and transparency between the different component parts of the system emerge. Focus on consensus. Attention is paid to improving compliance and delivery on decisions through improved engagement with the structures required to deliver on decisions (training workshops, information sessions etc), however focus remains on getting people to deliver on decisions made rather than to contribute to how they are made. Distributed leadership models start to emerge and consolidate in diverse parts of the system. System weavers and orchestrators gain terrain and start to be recognized by the system as value creators.	Leadership focus is on building a progressively stronger capacity within the system for emergence, agility, responsiveness, ability to adapt to uncertainty and to rapidly changing contexts. Leadership is intentionally distributed across the ecosystem. A key leadership role is the facilitation of spaces for reflection, sense making and collectivism. Focus has moved away from scaling, outputs and outcomes towards intention and trajectory of evolution and change, and a shared understanding of the purpose of the system. The focus is on ensuring a healthy and enduring relational paradigm which can withstand setbacks and complexity, rather than a project based paradigm. High attention is paid to connection, communication, a two-way flow of information and of input. Orchestrators and weavers are sustained by the system. Discussion and richness of diverse and divergent input is actively fostered.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Power redistribution
Guiding question: How is power redistributed by the leaders? How are decisions made in the system?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Inclined to be centralized and centralizing. Patterns of centralizing hierarchy replicated throughout the system (e.g. at macro, meso and micro levels - pyramidal type structure). Each layer of the leadership hierarchy feels disempowered by the layer above it. Leaders at the meso and micro levels feel that they have little voice or autonomy, and are often resentful. Positional leaders take responsibility for how the systems operate and are in charge of making all decisions. Stakeholders from the formal educational system as Schools, Universities and Ministries hold a huge power in the ecosystem.	There is some flexibility in the process of decision making within higher levels of the structure, but delivery on decisions is less flexible. Sub-specialist task teams may be set up to gather and process information. Stakeholders from the formal educational system as Schools, Universities and Ministries hold a predominance of power in the ecosystem. Some structures may be set up that allow for "contained/ circumscribed" or "practice" leadership experiences - e.g. Parent Teacher associations/ Student Leadership bodies / Junior City Councils etc, however these structures have minimal impact on the significant and influential decisions that are made within the system. Decision making itself is not radically decentralized. When decisions are shared, some attention is made to obtaining buy-in and mobilizing support around delivery on decisions made. System orchestrators and weavers emerge informally as outsiders to better distribute participation and decision making across the system.	An emergence of distributive and consensus based leadership approaches starts to be seen. Conscious attention is given to making spaces for sense-checking, dialogue and the inclusion of diverse and divergent viewpoints. An increased level of appreciation and respect is given to perspectives emerging from positions that have not traditionally been regarded as powerful. There is an awareness that single viewpoints can provide a very limited ability to influence the system. Initial feedback mechanisms are being created and starting to be put in place. Leadership starts to support creative discussions and allows for dealing with dissent. Multiple layers within the system start to become active participants and contributors to decision making, and to localize and contextualize this. There is increased ownership and opportunity for decision making that occurs at the meso and micro levels of the system. Orchestrators and weavers are active seekers of power distribution, wide and deep engagement.	Holacratic structures and processes are designed for relationality, conversation and transparency. Leadership structures are flexible and needs driven, allowing for easy and intentional transference of leadership roles according to context, needs and skills. The structure of the system is primarily designed to be a communication and relationship enabler, rather than a control enabler. Diverse, alternative and differing opinions from both within and beyond the particular system are actively sought out and included, and are recognised to bring rich thinking and creativity to the decision making process. Feedback mechanisms are consciously set to invite the dissenting voices. Dialogic and consultative processes are not only held prior to decision making, but as a regular feature of the learning ecosystem. Decision making becomes progressively more decentralized as trust develops, and the learning ecosystem develops a stronger sense of shared objectives, purpose and direction. Decentralized decisions are aligned with the collective intention of the learning ecosystem, but do not need to be controlled by it. Decision making incorporates the needs and views of dissenting voices. It is regarded as a valuable aspect of ensuring that relationships are open, honest and safe. System orchestrators, cultivators and weavers are deeply integrated within learning ecosystem function. These are regarded as essential skills, and the capacity to act as such becomes diffused within the system (ie, the capacity moves from one of individually held roles, to a widely shared capability amongst many stakeholders and across many parts of the system to hold such energies.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS
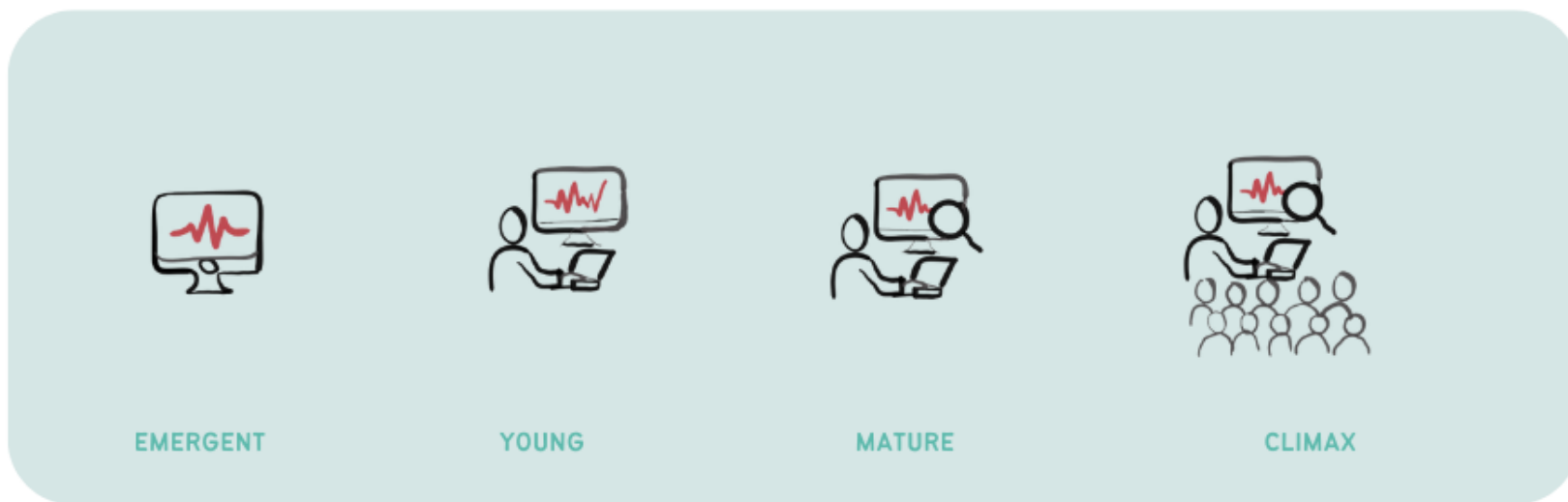
Enabler 4: Culture
Guiding question: What are the leadership practices that you see in your system? How do you gather information? How do you facilitate and communicate?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Decision making tends to be centralized and information gathering that informs decision making generally flows upwards through formal and themselves hierarchical structures. Little attention is paid to information derived from non-formal roles, or from roles that do not fit into the classical flow of information in the system. Decision making is relatively autocratic and may be experienced as dismissive (decisions which are made " for the good of" others) Decisions made tend to flow back downward through the structure as instructions. Instructions are clearly boundaried, and where they are not, interpretation of instructions tends to be conservative and they are interpreted in a narrow rather than a broad form. Clear lines of authority are put in place. Obedience and prompt action are valued. Leaders at the lower ranks tend to feel disempowered and they lack control and/or defer control to upper structures. Dissent tends to be regarded as disrespect and insubordination. Obedience and compliance are expected. There is little/ no room to question leadership. A high level of disaggregated metric-based decision making is undertaken.	Key decision makers tend to control the opportunities created for engagement and participation - less powerful decision makers may exercise their right to participate through group action (unions, strikes, protests etc). Consultation is occurring, and is seen as a way to gain additional insights that are relevant to decision making. There are opportunities for facilitation of debate on key decisions - some of this debate may be forced by dissenting stakeholders (unions etc). Dissent is viewed as confrontational and the focus remains on persuading those with a dissenting voice to accept the primary view. Leaders expect stakeholders to understand and equip themselves with the decisions made. Time is given to ensure that people train, perform or execute what was agreed on or the decision.	Shared decision making enhances shared ownership. The mechanisms provided by the ecosystem focus on collaborative participation allowing higher levels of consultation while in the decision making process. Spaces for the facilitation of dialogue are created. The responsibility for creating these spaces can rest in diverse parts of the learning ecosystem, and participants from widely differing parts of the system may be included. Structures are established to disaggregate the decision-making process. There is increasing willingness and appetite to engage with diverse stakeholders. Divergent voices start to feel safe to articulate their experiences and opinions. There is a greater commitment given to hearing each other's voices and understanding each other's perspectives.	Trust is actively facilitated and built throughout the system. High flexibility, resiliency and distribution of power and decision making. The ecosystem has a high level of democratic governance and emancipatory participation. Co-creative capacity is high, with generative spaces forming between system actors with regularity and consistency. Dissent is actively welcomed as a source of valuable information and divergent viewpoints. Whole system weaving capacity is present, and a collaborative culture is actively fostered and supported throughout the learning ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

VII.   Dimension 7: Monitoring Evolution

Evolutive Dimensions	Enablers	Guiding questions
7. Monitoring Evolution Systematic tracking of ecosystem's Evaluation, Assessment, Reflection, collective Learning, Understanding, and evolutionary Actions 	DEFINITION	What do we mean by monitoring evolution? Who leads and participates in the monitoring of evolution? Moving from a hierarchical to an engaged participatory process.
	PURPOSE	What is the purpose of Monitoring the evolution of the ecosystem?
	DATA MANAGEMENT	How is data managed? (type of info, evolving levels of safety, privacy, transparency, openness)
	EVOLUTIONARY PROCESS	What degree of reflection and learning takes place on ME&A outcomes by system stakeholders? How does ME&A translate from learning to intentional training? (levels of effectiveness) How does ME&A translate from learning to action/change that aims to evolve the ecosystem? (levels of effectiveness)

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 1: Definition
Guiding question: What do we mean by monitoring evolution? Who leads and participates in the monitoring of evolution?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
System monitoring (tracking of data, task completion and deliverables) and evaluation (looking at the patterns) activities are present. Regulated sets of activities and actions are created to achieve specific outcomes, which are then assessed using standardized units of measurement to detect improvements. System outcomes, educator performance and learner achievements tend to be aggregated and grouped for assessment. Monitoring, evaluation and assessment is performed by specialists, researchers and practitioners who are generally independent consultants to stakeholders within the system. There is an externally moderated approach to monitoring, evaluation and assessment.	Monitoring of data, evaluation of the patterns that are seen within the data, and an assessment of the meaning of those patterns occurs. Early reflection on what might be driving or underpinning the data is seen - with internal engagement to get different perspectives and experiences that might enrich this reflection. Specific monitoring and evaluation roles within organizations begin to emerge.	Monitoring, evaluation, assessment, reflection, learning and understanding occurs. Monitoring and evaluation are considered as the baseline activities which generate the data required to undertake more deeply reflective processes. Reflective practices amongst stakeholders enable them to learn how data responds to interventions over progressive cycles, and to start to be able to better understand the driving forces and dynamics at play within the learning ecosystem. Both in-house monitoring and evaluation experts, and those stakeholders who deliver on the outcomes on the ground are intimately involved in reporting and reflecting on both the outcomes and the determinants of those outcomes. Professionalisation of the Monitoring evolution space is supported, and many stakeholders are supported to understand how to contribute, engage with and reflect upon data. There is a specialized regional institution in charge of leading this work.	Monitoring, evaluation, assessment, reflection, learning, understanding and evolution is present. The process of engagement with data becomes a complete and comprehensive journey to generate shared insight and understanding. Through clear visualization of relevant and meaningful data, stakeholders across the learning ecosystem are supported to co-reflect on the meaning and drivers of that data, learning from the iterative processes of tracking and engaging with data over time. Overall, the entire process is one which enables both individual and collective groupings of stakeholders to understand the dynamics and energies at play within the learning ecosystem, and to have the agency and insight to be able to act at the relevant points within the system to effect positive shifts towards the attainment of SDG 4. All the stakeholders are given the opportunity to input, view and reflect together on the data generated in the system in such a way that collective understanding occurs. Stakeholders are able to positively change and impact the system they are working in which in turn enables learning. In a thriving learning ecosystem, information is shared and extends beyond groupings of "like-minded people" to those at the edges of the system with very diverse perspectives and opinions. The learning ecosystem and those within it becomes self-reflective. Recipients of learning are themselves the ones who take part in the collection and interpretation of data, while supported by other stakeholders in the system.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 2: Purpose
Guiding question: What is the purpose of Monitoring the evolution of the ecosystem?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
The primary purpose for monitoring evolution is control and management of stakeholders downstream in the system hierarchy. The goal of monitoring and evaluation is to evaluate outcomes of pre-set fixed goals and decisions (e.g. pass rates, literacy levels, school drop-outs etc). Approach is project focussed and finite.	Control and oversight, seeking deeper understanding of systems processes, influence and change. In-house Monitoring and Evaluation experts focus on reporting on the deliverables expected from those in power. Growing interest and capacity to reflect on data, and to understand what the conditions are that are causing data to manifest.	Learning and understanding is increasingly regarded as the core purpose of the data assessment process. There is an interest in increasing the level of shared understanding of what is happening in the system. Increasing levels of reflective capacity are built, with an aim to grow levels of shared understanding and commitment to the actions required to improve the learner and stakeholder experience of the system, as well as to improve outcomes. Roles for managing outcomes are redistributed and are sited closer to the point at which data is being collected. At the level of educational institutions, understanding learner performance is now regarded as a holistic team process	The purpose of Monitoring Evolution is to allow for deep levels of shared understanding between stakeholders of the dynamics that are at play within the learning ecosystem. This supports self-regulated and self-facilitated actions by stakeholders towards the achievement of the shared purpose of achieving SDG 4. This process allows for continuous improvement of the learning ecosystem as a whole, responsiveness to needs and context, and widespread stakeholder participation and engagement with learning. The goal is empowerment and agency of stakeholders and stakeholder groupings, and an increasingly strong reflective capacity within the system

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 3: Data Management
Guiding question: How is data managed?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Technical Assessment is strongly based on a test and examination approach to materials taught. Accuracy in the repetition of materials taught is highly valued. Errors are frowned upon. Judgmental assessment criteria are applied. Narrow assessment criteria predominate. Little room for learners with alternative learning needs, approaches or alternative interests and capabilities. Poor academic outcomes dramatically impact on future life opportunities with little scope for alternative non-academic career pathways. System assessment tends to be quite mechanical - e.g. assessing whether all the roles in the system are filled, if the people occupying those roles are fulfilling their tasks and objectives as set. Tickbox approach. Heavy dependency to external evaluations.	Multiple types of data are collected, mainly quantitative. Efforts are made to sense, check and correlate data from different sources, such that a deeper understanding of why the outcomes seen are occurring is derived. Systems are put in place for data collection to be more intuitive and immediate, as well as for data to be more visible, accessible and user friendly for a wide range of stakeholders within the learning ecosystem. Stakeholders have restricted access to the data. Connections between data points are starting to be visualized, allowing some stakeholders to (a) understand how different data sets relate to each other (b) draw down into the data to understand how data impacts different points of the system and (c) allow for specific actions to be taken at the right points within the learning ecosystem (i.e. individualized learning to be taken at the correct point). Sites of data collection and data reflection become increasingly closer. Data is much richer, more relevant and usable.	Multiple source data collection is occurring - quantitative, qualitative, case study, reflective, action research, ethnographic etc. Efforts are made to sense, check and correlate data from different sources, such that a deeper understanding of why the outcomes seen are occurring is derived. Systems are put in place for data to be more visible, accessible and user friendly. Stakeholders are supported to access, interpret and understand data in such a way that it informs their decision making. Connections between data points are starting to be visualized this allow for (a) stakeholders to know how data relate with each other (b) draw down into the data to understand how these data impacts different points of the system and (c) allow for specific actions to be taken at the right points (i.e. individualized learning to be taken at the correct point). Sites of data collection and data reflection become increasingly closer. Data is much richer, relevant and usable.	Action research is utilized, alongside multiple source data collection and interpretative techniques. Data gathering is an active part of implementation of projects, and the process of measurement is in itself able to support, visualize and positively modify in a highly agile way the delivery of the intended outcomes. Highly responsive, agile, real time interpretation of data by the participants themselves is supported, such that system actors can see, understand, interpret, and act on the data with little/no lag. Data is highly visible and transparent. Multiple types of data, from across the spectrum of stakeholders within the system sought out and valued. It is used to facilitate understanding, co-reflection and generative action. Data is relevant to the context of the stakeholders. Self-sovereign data is highly valued, and the sharing of such data is enabled because of the high levels of relationality, co-operation, co-reflection and co-creation within the learning ecosystem.

5. DESCRIPTION OF DIMENSIONS AND ENABLERS PICTURED IN THE 4 EVOLUTIONARY STAGES OF FLOURISHING LEARNING ECOSYSTEMS

Enabler 4: Evolutionary process
Guiding question: What degree of reflection and learning takes place on ME outcomes by system stakeholders? How does ME translate from learning to intentional training? How does ME translate from learning to action/change that aims to evolve the ecosystem?

Stage 1 Emergent	Stage 2 Young	Stage 3 Mature	Stage 4 Climax
Targeted actions or projects. Directly deploy an action or project to address a narrowly bounded education need. Huge dependency to external evaluations. Monitoring and evaluation processes may be experienced as stressful and punitive. Reflective capacity within individual organizations and within the system as a whole is low. Engagement within and across micro/ meso/ macro levels tends to be instructional and focused on outcomes, deliverables, metrics and goal achievement. Within educational institutions, there is little room for learners with alternative learning approaches or alternative interests and capabilities. Poor academic outcomes impact on future life opportunities with little scope for alternative non-academic career pathways.	Scaling actions or projects are undertaken. Direct deployment of an action or project to remedy a dysfunctional or missing part of the system that addresses a widespread need starts to occur in a sustained way. There is a movement away from using quantitative data alone to assess the various conditions within the system that are required to achieve the outcomes sought (e.g. Are actors within formal roles being adequately supported to achieve the objectives set?) Some feedback via formal channels within the system is used to assess how effectively the system is functioning. Nascent reflective capacity is seen within individual organizations and stakeholder groupings. Within schools and education institutions, data collection on learners increasingly becomes an educator moderated process. Educators are expected to take a deeper level of interest in assessment and assessment results. They are in charge of understanding what is happening that is contributing to these learning outcomes. They may engage with relevant parties such as parents or learners themselves in order to seek understanding.	Innovation starts to be seen within the system. Work to identify and disrupt problematic dynamics or amplify positive dynamics to shift a piece of the system starts to occur. Whole team, self- and peer-assessment approaches begin to be encouraged. Professional learning networks are being established. System stakeholders begin to engage with each other to develop joint/ aligned evaluation practices. System stakeholders engage in reflective processes to evaluate the data gathered - these processes start to include not only interest and focus aligned stakeholders, but also stakeholders who have different and diverse perspectives and might be able to pick up new and useful information from the data. Early efforts are made to overlay the evaluations occurring in different parts of the system, in order to build up a shared evaluation of the overall health of the extended learning ecosystem. Within learning institutions, integrated processes in understanding the whole learner are developed. Parental engagement is actively sought and encouraged. Learners are encouraged to expand their knowledge beyond the boundaries of the formal curriculum. Knowledge sharing, knowledge expansion and deepening of understanding are included in assessment of a student's ability to engage with educational materials.	The ongoing transformation of the system becomes a compelling goal. Working with a network of actors across sectors that represent the larger system to engage multiple dynamics in an effort to fundamentally shift the system to a healthier state becomes a standard approach to understanding and engaging with system dynamics. The learning ecosystem becomes progressively more able to see itself. Stakeholders within the system are able to understand their roles, impact and influence within the system (ie, they can sense the system as a whole, as well as their place within it). Within learning environments and learning institutions, alternative pathways to assessment are welcomed and actively encouraged. There is strong emphasis on learner autonomy and agency. Learners are encouraged to self-assess, understand and view the educators as active partners and facilitators of learning. Learners are encouraged to look for their strengths beyond the four walls of the classroom and to understand their unique make-up and contribution to their own learning process.

6. Conclusions

The Evolutionary Framework and approach is an invitation into our ongoing collective understanding of how flourishing learning ecosystems grow and emerge, rather than as a definitive description of this. In this nascent field, we are all seeking new language, new insights, and new approaches for how learning may adjust to a rapidly changing world view and world experience. Hence, this is a first step and an invitation to other partners in and beyond this sector to use and evolve the evolutionary framework and transform the way we lead flourishing and learning complex systems, morphing and shifting to optimise human learning potential alongside the deep changes happening to us all.

We hope that this early inter the developmental and evolving nature of flourishing and learning ecosystems may help us to shift our understanding of how learning and flourishing happens in a nation wide macro level, focusing on the dynamic and organic process of how opportunities are weaved through interaction along the whole system. Thus, focusing on building social connection and social infrastructure to strengthen the flourishment and resilience of the whole ecosystem as an organic entity, rather than overfocusing our resources on a mechanistic approach based on effectiveness and final results. We believe that this initial framework and guidelines offer a supportive and manageable conceptual approach for government leaders, policy makers and researchers to use as we progressively shift our mental models, and further, enable us to act to realise them in our own learning environments.

With this report we claim to provoke and ongoing series of exploratory discussions and experimentation in opening space for the emergence of new learning approaches, structures and attitudes - not with a view to arriving at "the correct one", but rather with a view to honing our ability to be in constant conversation and dialogue, and to become increasingly familiar and comfortable with uncertainty, emergence, and generative co-creation. We believe this framework can inspire new research and practice by the development of contextualized models to better support and holistically weave these ecosystems. One specific area of growth is the exploration of specific leadership practices and tools that support policy makers and leaders to activate the 7 dimensions and subsequent enablers for ecosystem evolution and development. In this sense, Report II and Report III explore two different research based tools that support school leaders and government leaders to weave flourishing and learning ecosystems development and growth in practice.

In terms of digital ecosystems, this model helps us to grow the scale and hybridization of digital and learning ecosystems. Currently digital ecosystems are considered primarily from a technological standpoint - ie in terms of how digital tools relate to each other. This scope is limited in terms of how we conceive the integrating and connecting potential of technology. By contrast, the model presented requires that we shift our understanding to expand the scope and scale of our understanding digital ecosystem, recognising that they offer a significant integrating opportunity for the human stakeholders within the system, and hold the potential to accelerate learning access and value, and our capacity to modulate this, in a way never before conceived possible. Therefore, our work shows that the development of digital ecosystems must be closely connected with the wider learning ecosystem to better serve a collective flourishing and learning purpose. This model furthermore helps us to clearly articulate the key intention behind our use of technology for crafting humanised and humanising learning ecosystems. It points to the actions and processes needed within digital ecosystems to allow for true, deep and meaningful, ethical and human-centred interoperability. Contained within this approach is the opportunity to conceptualise how to better access available data, and to provide meaningful access and insight into this data, even for those who are isolated from the digital space.

It is relevant to say that while this model has been developed in partnership, and through examination of multiple different learning ecosystem practices and models around the globe, these still form the minority of (and fairly alternative) approaches to how learning and education is undertaken. Our hope is to continue to engage with existing and as yet unknown to us learning ecosystem models, to corroborate or challenge the suggested framing offered here, as well as engage with education and learning systems that have an appetite to move towards an evolutionary learning ecosystem model. Through such engagement and practical experimentation and use, we hope to deepen and evolve our collective understanding of this process

The Evolutionary Framework we present becomes a tangible resource for leaders and changemakers across the system -as researchers, policy makers, implementers, entrepreneurs and funders- and across continents and hemispheres. Thus, it becomes a shared board to come together and start the ideation and prototyping of new tools and methods that strengthen our ecosystems for greater flourishment and learning, empowering our unexplored collective capacities to face the tremendous challenges that we already have and new ones that will emerge.

Next Steps

1. Ongoing discovery and engagement process to allow for the validation and evolution of this approach.

2. Discovery of well-situated and willing stakeholders who have appetite for this approach, and are willing to start bringing this into a practical experimental space.

3. Concomitant and continuous experimentation, adoption, reflection and ongoing evolution in our understanding of, as well as in our ability to apply the model and future iterations of it.

4. Development of new tools for systemic thinking and systemic diagnosis of the health of the flourishing and learning ecosystem at a national level.

5. Development of training programmes to share these competencies and framing through action research practices.

7. References

Anneloes Smitsman, Alexander Laszlo & Pavel Luksha (2020) Evolutionary Learning Ecosystems for Thrivable Futures: Crafting and Curating the Conditions for Future-Fit Education, World Futures, 76:4, 214-239, DOI: 10.1080/02604027.2020.1740075

Azorín, C., Harris, A., & Jones, M. (2020). Taking a distributed perspective on leading professional learning networks. School Leadership and Management, 40(2-3), 111-127. https://doi.org/10.1080/13632434.2019.1647418

Bevan, B. (2016). STEM learning ecologies: Relevant, responsive, and connected. Retrieved from http://csl.nsta.org/2016/03/stem-learning-ecologies/

Bronfenbrenner, U. (1979). The ecology of human development: Experiment by nature and design. Cambridge, MA: Harvard University Press. Bryk, A. S. (2015). 2014 AERA distinguished.

Bronfenbrenner, U. (1974). Developmental research, public policy, and the ecology of childhood. Child Development, 45(1), 1-5.

Catalyst 2030. (n.d.). Retrieved from https://catalyst2030.net/

Clayton, R. (2016). *Building innovation ecosystems in education to reinvent school: A study of innovation and system change in the USA.* Winston Churchill Memorial Trust.

Daly, A. J. (2010). Social Network Theory and Educational Change. Harvard Education Press.

Daly, A. J., & Liou, Y-H. (2020). A capital idea: Exploring the relationship between human and social capital and student achievement in schools. Journal of Professional Capital and Community, ahead-of-print(ahead-of-print). https://doi.org/10.1108/JPCC-10-2020-0082

Díaz-Gibson, J. & Daly, A. (2020). What if we understand Schools as Learning Ecosystems in times of COVID-19 pandemic. Teachers College Record. Retrieved from: https://www.researchgate.net/publication/343760768_What_if_we_understand_Schools_as_Learning_Ecosystems_in_times_of_COVID-19_pandemic

Dream a Dream India. (n.d.). Home. Dream a Dream. https://dreamadream.org/

Economist Impact. (2022). Learning Ecosystem Framework Literature Review. Retrieved from: https://cdn.vev.design/private/BCwBc9ZFZyVz8yQQKr9VeLxSnjf1/97_NWlW5Wo_Economist%20Impact_Learning%20Ecosystems_Whitepaper.pdf.pdf

Education Reimagined. (n.d.). Home. Education Reimagined. https://education-reimagined.org/

Engeström, Y. (2007). From communities of practice to mycorrhizae. In E. Wenger, R. McDermott, & W. M. Snyder (Eds.), Communities of Practice (1st ed., pp. [Page range]). https://doi.org/10.4324/NOE0415364737.ch4

Ferlian, O., Cesarz, S., Craven, D., Hines, J., Barry, K. E., Bruelheide, H., Buscot, F., Haider, S., Heklau, H., Herrmann, S., Kühn, P., … (additional authors). (2018). Mycorrhiza in tree diversity–ecosystem function relationships: Conceptual framework and experimental implementation. [Journal Title], Volume, [Page range]. https://doi.org/10.1002/ecs2.2226

Freire, P. (1970). Pedagogy of the Oppressed. Herder and Herder.

Global Education Futures. (2020). Learning ecosystems: An emerging praxis for the future of education.

Global Education Futures. (n.d.). Home. Global Education Futures. https://www.edu2035.org/

Hascher, T., Beltman, S., & Mansfield, C. (2021). Teacher wellbeing and resilience: towards an integrative model. Educational Research, 63(4), 416-439. https://doi.org/10.1080/00131881.2021.1980416

Hecht, M. & Crowley, K. (2020) Unpacking the Learning Ecosystems Framework: Lessons from the Adaptive Management of Biological Ecosystems, Journal of the Learning Sciences, 29:2, 264-284, DOI: 10.1080/10508406.2019.1693381

Ion, G., & Brown, C. (2020). Redes entre escuelas para la mejora educativa. ¿Qué prácticas son las más efectivas? Retrieved from https://ivalua.cat/sites/default/files/2020-12/Que_funciona_19_castella-v6.pdf

Jacobs Foundation. (n.d.). Home. Jacobs Foundation. https://www.jacobsfoundation.org/en/

Learning Planet. (n.d.). Home. Learning Planet. https://learningplanet.org/

Lomas, T., & VanderWeele, T. J. (2023). The Mental Illness-Health Matrix and the Mental State Space Matrix: Complementary meta-conceptual frameworks for evaluating psychological states. Journal of Clinical Psychology, 79(8), 1902-1920. https://doi.org/10.1002/jclp.23512

Longás Mayayo, J., de Querol Duran, R., Cussó Parcerisas, I., & Riera Romaní, J. (2019). Individuo, familia, escuela y comunidad: apoyos multidimensionales para el éxito escolar en entornos de pobreza.

Luksha, P., & Kinsner, W. (2020). Transformation into a New Education Paradigm and the Role of Ecosystemic Leadership. CADMUS, 4(2).

MacIntyre, P. D., Gregersen, T., & Mercer, S. (2020). Language teachers' coping strategies during the Covid-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions. System. https://doi.org/10.1016/j.system.2020.102352

Meherali, S., Punjani, N., Louie-Poon, S., Abdul Rahim, K., Das, J. K., Salam, R. A., & Lassi, Z. S. (2021). Mental Health of Children and Adolescents Amidst COVID-19 and Past Pandemics: A Rapid Systematic Review. Int. J. Environ. Res. Public Health, 18(7), 3432. https://doi.org/10.3390/ijerph18073432

Minozzi, S., Saulle, R., Amato, L., & Davoli, M. (2021). Impact of social distancing for covid-19 on the psychological well-being of youths: A systematic review of the literature. Sapienza University of Rome. DOI:10.1701/3608.35873

Morin, E. (2001). La méthode 6: Éthique. Le Seuil.

National Research Council. 2015. Identifying and Supporting Productive STEM Programs in Out-of-School Settings. Washington, DC: The National Academies Press. https://doi.org/10.17226/21740.

Office of the U.S. Surgeon General. (2023, May 3). New Surgeon General advisory raises alarm about the devastating impact of the epidemic of loneliness and isolation in the United States. U.S. Department of Health & Human Services. https://www.hhs.gov/about/news/2023/05/03/new-surgeon-general-advisory-raises-alarm-about-devastating-impact-epidemic-loneliness-isolation-united-states.html

Page, L. C., & Scott-Clayton, J. (2016). Improving college access in the United States: Barriers and policy responses. Economics of Education Review, 51(C), 4-22. https://doi.org/10.1016/j.econedurev.2016.02.009

Penuel, W. R., Bell, P., Bevan, B., & Buffington, P. (2016). Enhancing use of learning sciences research in planning for and supporting educational change: Leveraging and building social networks. Journal of Educational Change, 17(2). https://doi.org/10.1007/s10833-015-9266-0

Pöysä, S., Pakarinen, E., & Lerkkanen, M.-K. (2021). Patterns of Teachers' Occupational Well-Being During the COVID-19 Pandemic: Relations to Experiences of Exhaustion, Recovery, and Interactional Styles of Teaching. Frontiers in Education: Educational Psychology, 6. https://doi.org/10.3389/feduc.2021.699785

Provan, K. G., Milward, H. B., Kenis, P., & Klijn, E. H. (2001). Interorganizational Networks and Network Governance. In C. Cropper, M. Ebers, C. Huxman, & P. S. Ring (Eds.), The Oxford Handbook of Inter-Organizational Relations (pp. 423-452). Oxford University Press.

Remake Learning. (n.d.). Home.

Rajmil, L., Hjern, A., Boran, P., Gunnlaugsson, G., de Camargo, O. K., & Raman, S.; International Society for Social Pediatrics & Child Health (ISSOP) and International Network for Research on Inequalities in Child Health (INRICH) COVID-19 Working Group. (2021). Impact of lockdown and school closure on children's health and well-being during the first wave of COVID-19: a narrative review. BMJ Paediatr Open, 5(1). https://doi.org/10.1136/bmjpo-2021-001043

Remake Learning. (n.d.). Home. Remake Learning. https://remakelearning.org/

The Weaving Lab. (n.d.). Home. The Weaving Lab. http://weavinglab.org/

UNESCO. (2019). New Methodology Shows that 258 Million Children, Adolescents and Youth Are Out of School. Retrieved from http://uis.unesco.org/sites/default/files/documents/new-methodology-shows-258-million-children-adolescents-and-youth

UNESCO. (2020). Global education monitoring report: Inclusion and education: All means all. https://doi.org/10.54676/JJNK6989UNESCO. (2020).

UNESCO, & International Association for the Evaluation of Educational Achievement. (2022). The impact of the COVID-19 pandemic on education: International evidence from the Responses to Educational Disruption Survey (REDS). UNESCO. ISBN: 978-92-3-100502-2

United Nations Educational, Scientific and Cultural Organization. (n.d.). Home. UNESCO. https://www.unesco.org/

VanderWeele, T. J. (2017). On the promotion of human flourishing. Proceedings of the National Academy of Sciences of the United States of America, 114(31), 8148-8156. https://doi.org/10.1073/pnas.1702996114

VanderWeele, T. J. (2020). Activities for flourishing: An evidence-based guide. Journal of Positive School Psychology, 4(2), 137-145.

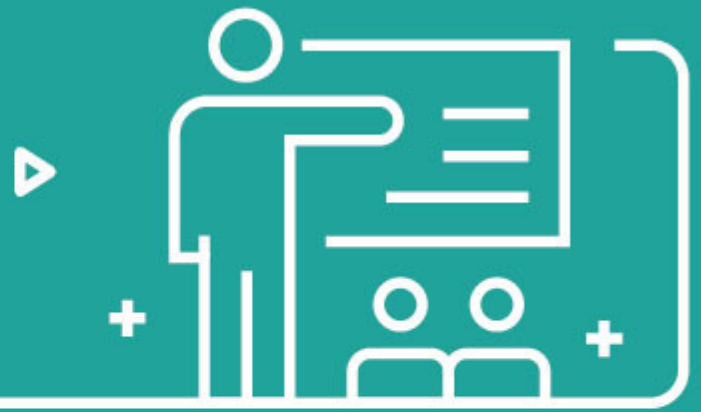WISE and the Qatar Foundation. (2021). Developing learning ecosystems in Qatar to advance equity, inclusions, and social cohesion. Retrieved from https://www.wise-qatar.org/developing-local-ecosystems-qatarreport/

WISE and the Qatar Foundation. (2022). Designing Learning Ecosystems. Retrieved from https://www.wise-qatar.org/app/uploads/2022/07/wise-living-lab-playbook--designing-learning-ecosystems-introduction.pdf

World Health Organization. (2021). WHO guideline on school health services. Retrieved from https://iris.who.int/bitstream/handle/10665/341910/9789240029392-eng.pdf?sequence=1

World Innovation Summit for Education. (n.d.). Home. WISE. https://www.wise-qatar.org/

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