

Informal Learning in Contexts of Vulnerability: A Relational Ontology of Education

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Abstract

This article analyses the role of informal learning in contexts of vulnerability and discusses its implications for an ontological reconceptualisation of education in relational terms. Adopting a non-individualising definition of vulnerability—understood as a position produced by institutional structures and structural inequalities—the article offers a conceptual review of the literature on poverty, forced migration, socio-economic marginalisation and systemic crises. It argues that the informal sector supports three interrelated functions: daily survival, biographical and cultural continuity, and agency (individual and collective), while often remaining invisible within educational systems regulated by epistemic hierarchies that privilege formal and certified knowledge. The article then develops a five-step framework (produced vulnerability, functions of the informal, epistemic (in)justice, learning ecologies, relational ontology) and discusses its implications for recognition-oriented research, practices and policies.

Keywords: Informal learning, vulnerability, relational ontology of education, epistemic injustice, learning ecologies, agency, recognition/validation

1. Introduction

In recent years, a significant part of the educational literature has questioned reductive conceptions of education as the mere transmission of content or as a process confined to the institutional spaces of the school, highlighting instead its relational, situated and processual nature. In this sense, education is understood as a practice emerging from the interaction between subjects, contexts and structural constraints, capable of generating local and biographical transformations (Patera, 2021), and as an activity based on the dynamic relationship between oneself, the other and the object, articulated through dimensions of space and time that define its meaning (Touriñán López, 2021). These approaches are reflected in studies that analyse education from the perspective of places and postures of everyday experience, showing how learning unfolds according to non-linear temporalities, but through pendular movements between life trajectories and paths of knowledge (Moreno, 2018). Against this backdrop, vulnerability is understood as a relational and socio-political construct, not as an individual attribute: a position produced by institutional structures, governance mechanisms and structural

inequalities that affect access to rights, resources and educational recognition. The literature highlights how this position emerges from the intertwining of institutional practices, educational mechanisms and social structures, which differentially modulate available resources, opportunities for participation and symbolic recognition (Abiétar López et al., 2015; Jahnukainen & Itkonen, 2021; Righetto et al., 2022). In light of these considerations, informal education takes on a central role in contexts marked by poverty, forced migration and marginalisation, becoming a privileged space for the development of agency and the construction of meaning. Studies oriented towards the ecological perspective of learning show that agency is not a given individual property, but the result of a situated interaction with the contexts of action and the educational opportunities available (Biesta & Tedder, 2007; Evans, 2019). In particular, informal learning in situations of crisis or transition is crucial for biographical continuity and for the construction of meaningful identities and life trajectories, especially for young people and adults in conditions of structural vulnerability (Rambla & Kovacheva, 2021). Research conducted in informal education contexts also highlights the existence of genuine learning ecologies (), capable of overcoming the institutional limitations of school education and enhancing experiential knowledge, collaborative practices and community resources (Márquez-García et al., 2021; Forgione, 2021). Finally, the literature on education in contexts of migration and humanitarian crisis shows how, in the absence or interruption of formal education, informal learning becomes a fundamental resource for survival, the processing of experience and the construction of forms of individual and collective resilience (Fujii et al., 2020; Benhura & Naidu, 2021; De Maria et al., 2023), confirming the need to rethink education beyond the boundaries of school and from an ontologically relational perspective. In this contribution, I propose a theoretical shift: from the analysis of informal education as a complementary or compensatory domain to formal education, to the proposal of a relational ontology of education. This perspective allows us to read education as an emerging quality of situated practices, relationships and contexts, and to critically question the epistemic hierarchies that define what is recognised as legitimate learning. The proposed theoretical repositioning is articulated in an analytical chain consisting of five connected steps: (1) vulnerability is assumed as a position produced by institutional structures, governance mechanisms and structural inequalities; (2) within this condition, informal learning is interpreted according to three interrelated functions—survival, biographical continuity, and agency; (3) the possibility that such learning will be recognised as knowledge depends on mechanisms of epistemic (in)justice, which can generate silencing, devaluation, or invisibilisation of experiential knowledge; (4) these processes are distributed across multi-situated learning ecologies, traversed by actors, resources and artefacts; (5) this leads to a proposal for a relational ontology of education, understood as an emerging quality of (human and socio-material) relationships that

enable recognition, access to resources and the production of meaning in contexts of vulnerability.

2. Vulnerable contexts as produced spaces: a relational perspective

Treating vulnerability as a relational construct allows us to shift the analysis from individual profiles to the conditions that make it possible and persistent, and to read vulnerable contexts as produced spaces. The analysis of vulnerable contexts in these terms finds a solid foundation in the most recent academic literature, which converges in overcoming individualising or psychologising approaches to vulnerability and instead traces it back to systemic and structural dynamics that cut across political, economic and institutional structures (Sabates-Wheeler, 2019). More precisely, vulnerability is not an intrinsic attribute of the individual, but rather a condition emerging from the interaction between social policies, citizenship regimes, labour market configurations, migration, health and education systems. Treating it in these terms means taking it as a critical analytical category, useful for questioning the conditions that produce educational inequalities, rather than as a descriptive label applied to individuals or groups.

This theoretical stance is consistent with definitions that emphasise the relational and unstable nature of vulnerability. As Raffaghelli et al. (2020) observe, vulnerability can be understood as 'a relationship with a field of objects, forces and passions that affect or influence us in some way', rather than as a stable subjective disposition. Similarly, Dadvand and McLeod (2021) emphasise that vulnerability and resilience are not autonomous categories, but relational patterns that intertwine and reshape themselves over time, depending on historical and social contexts.

In this framework, the production of vulnerable contexts can be traced back to processes through which power regimes differentially distribute exposure to risk, access to resources and opportunities for recognition. As Honkasalo (2019; pp. 9-10) points out, vulnerability is 'created' and governed through institutional and discursive practices that not only expose certain groups to greater risks, but also symbolically define them as 'vulnerable', reinforcing relationships of dependency and power asymmetries. In this sense, policies of organised abandonment by the state and capital contribute to systematic disinvestment in specific communities, reproducing structural inequalities, segregation and racialisation of disadvantage (Riley et al., 2024).

The spatial dimension of these processes is particularly relevant because it shows how vulnerability is territorialised and made perceptible in everyday life. The concentration of incarceration in certain neighbourhoods, racial segregation and the unequal distribution of services are emblematic examples of how social control materialises in space, producing and consolidating territorialised vulnerabilities (Holder et al., 2022). Structural inequalities thus tend to become inscribed in actual spatial patterns of vulnerability, to the point of transforming cities into devices that, through territorial

imbalances and unequal access to resources, limit or deny the effective exercise of rights (Rodríguez-Zepeda, 2024).

This conceptual shift is crucial in order to overcome deficit-based or moralising interpretations of vulnerability, which risk reinforcing processes of stigmatisation and obscuring structural responsibilities. Recognising vulnerability as a complex and dynamic socio-spatial condition (Wagner, 2020) allows us to critically question the conditions that shape the possibilities of learning, acting and being recognised as educational subjects. As Marino and Faas (2020) and von Meding and Chmutina (2023) point out, labelling vulnerability as individual weakness can perpetuate forms of epistemic, semiotic and material violence, obscuring the practices of resilience, adaptation and meaning-making that emerge in these contexts.

That said, while it is true that vulnerability can be institutionalised and made pervasive throughout everyday life, it is equally true that social space retains creative potential. As Saatçioğlu and Corus (2016) observe, the same contexts marked by disadvantage can become places for experimenting with alternative practices, solidarity and informal learning. It is precisely in this ambivalence — between the structural production of vulnerability and the generative capacity of social contexts — that the need to rethink education as a relational, situated and distributed process lies.

3. Informal education in contexts of vulnerability: survival, continuity, agency

Informal education operates as a dynamic and multifunctional process, crucial for individual and collective resilience in situations of precariousness and social fragmentation. Often unintentional and tacit, it allows for the acquisition of knowledge, skills and values through everyday experience (Cino, 2020). In many vulnerable contexts, it becomes the primary—and sometimes the only—form of learning available, preventing education from being confined solely to formally organised contexts or those socially recognised as educational par excellence (Cino, 2020). It is not simply a matter of 'learning outside school', but a set of processes that intertwine daily survival, the production of meaning and the capacity to act (Rückert & Moreira, 2020).

Three fundamental analytical functions of informal education in contexts of vulnerability emerge from the literature and observed practices: support for daily survival, the production of biographical and cultural continuity, and the activation of forms of individual and collective agency. It is important, however, to avoid celebratory readings of the informal. In many cases, informal learning is not a choice but an adaptation to conditions of exclusion that make formal devices intermittent or inaccessible. The very centrality of the informal can therefore signal a lack of rights and services: recognising its educational value does not mean replacing institutional responsibility, but understanding its ambivalence and identifying the conditions that transform survival practices into effective opportunities for emancipation.

A first function concerns learning for survival, whereby learning arises from everyday or crisis situations and contributes to the construction of identity and autonomy (Rambla & Kovacheva, 2021). Through observation, imitation, experimentation and adaptation, children, young people and adults acquire practical skills that help them navigate unstable environments—from managing subsistence economies to navigating fragmented and often hostile bureaucracies. This dimension can also include the maintenance of internal, sometimes clandestine, organisational forms that support groups not tolerated by government authorities (Bravi & Vitale, 2017).

A second function concerns biographical and cultural continuity. In contexts of displacement or biographical rupture, rituals, narratives, religious and artistic practices, as well as the use of digital media, function as educational devices that preserve memories, values and belonging, offering symbolic anchors in conditions of uncertainty (Malaguti, 2023). Cultural preservation is particularly evident in communities marked by diaspora or forced nomadism, where informal education acts as a bulwark against assimilationist and other external pressures (Bravi & Vitale, 2017). In crisis contexts, the intergenerational transmission of knowledge and values within families and communities becomes a pillar of educational continuity, replacing formal education and strengthening social cohesion (Birhanu & Sala, 2025). Practices such as maintaining the mother tongue and cultural traditions not only protect identity but also operate as pedagogical tools for emancipation and mutual recognition (Rückert & Moreira, 2020; Zaffram, 2023).

A third function concerns agency. Even in highly hetero-directed contexts, people develop micro-practices of resistance, mutual aid and counter-narratives to stigmatising labels. These practices are deeply educational: they encourage a critical reading of contexts, the negotiation of margins of autonomy and the imagination of alternative trajectories for oneself and others. Such dynamics are crucial for cognitive development and psychological resilience, especially in conflict situations where formal schooling is interrupted (Phusavat & Buheji, 2024). Activities such as plant identification, animal observation, and understanding ecological processes can strengthen scientific thinking and curiosity, while participation in cultural or family traditions supports identity and belonging (Phusavat & Buheji, 2024). It is therefore essential to promote empowerment and self-determination, avoiding stigmatising frameworks that reduce people to stereotypes of victimisation (Vaccarelli & Zizioli, 2023).

Informal learning thus contributes to preserving cognitive reserve and promoting psychological well-being, particularly among children in conflict-affected areas (Phusavat & Buheji, 2024). A holistic approach to informal education supports not only immediate survival but also long-term resilience through adaptive skills and social capital (Birhanu & Sala, 2025). Informal learning opportunities—including those that emerge from recreational activities and storytelling—are crucial for children's personal

and intellectual development, allowing them to explore interests and acquire tools for critically understanding the world (Ramírez-Iñiguez, 2022; Tan et al., 2024).

The COVID-19 pandemic has further highlighted the importance of informal learning—especially when supported by parental involvement—in preventing developmental setbacks in the absence of formal educational structures. Communication and shared reading, for example, can mobilise society's educational resources as tools for self-improvement.

These informal processes are essential for consolidating and enhancing children's socio-cognitive skills, supporting a positive return to formal education (Dalledonne Vandini et al., 2022). Informal educational practices—often based on pedagogies of safety, trust, and emotional support—can mitigate the effects of trauma and promote resilience in vulnerable contexts (Meštrović & Bandov, 2024). Support can also be provided through online communities that function as social and collaborative learning environments, where knowledge is constructed through interaction and reflection (Cino, 2020).

This dynamism points to continuous and transformative learning, in which difficulties can be converted into opportunities for growth and renewal of educational services (Infantino, 2021). It also calls for the recognition of the home environment as an intrinsically rich h e of cultural stimuli and informal learning opportunities, valuing parents' skills as primary educational resources (Infantino, 2021). Educational policies should therefore recognise and integrate family and community resources, bridging the gap between school and informal educational practices (Iglesias Vidal et al., 2020). An integrated approach aims to create an enabling background that connects different paths and skills, transforming everyday experiences into meaningful learning for children (Dalledonne Vandini et al., 2022).

The synergistic interaction between schools, parents and local communities thus becomes an enabling factor in promoting educational environments that support individual and collective growth through continuous dialogue and constant questioning of dogmatic positions (De Simone & Papulino, 2023). This perspective requires a systemic approach that involves children's direct experience, family functioning, and social and environmental dimensions, operating on multiple levels to build resilience and social capital in communities (Guetta, 2023). Educating communities are emerging as fundamental pillars for supporting the holistic development of minors, integrating resources and social actors to respond to new needs, including those intensified in the post-pandemic era (Scialdone et al., 2022). Synergy between educational institutions, families and local networks is crucial for co-constructing practices capable of responding effectively to people's needs (Brandolini, 2022).

4. Epistemic hierarchies and educational (in)justice

Having assumed vulnerability as a produced and territorialised condition, and having focused on the role of informal learning in vulnerable contexts, it becomes necessary to clarify the issue – already anticipated in the analytical chain of the Introduction – relating

to the mechanisms of epistemic (in)justice that regulate the visibility and recognition of knowledge. Despite their relevance in contexts of vulnerability, knowledge produced through informal education practices is rarely recognised as fully 'educational'. Education and training systems are organised according to epistemic hierarchies that place formalised and certified disciplinary knowledge at the top, relegating experiential, tacit and contextual knowledge to the margins. This structure produces specific forms of epistemic injustice, understood as the systematic devaluation of the cognitive contribution of individuals and groups on the basis of structural prejudices and narrow criteria of legitimacy (Fricker, 2007; Dotson, 2014).

These epistemic hierarchies operate as devices of structural exclusion: they ignore or devalue knowledge generated by informal learning and reinforce a conception of education as a commodity to be distributed, rather than as a relational and collaborative process (Balarín et al., 2021; Omodan, 2023). In contexts where vulnerability is produced as a structural position that limits access to material and symbolic resources (Sabates-Wheeler, 2019), the failure to value alternative forms of knowledge contributes to reproducing marginalisation, rendering invisible skills that are crucial for everyday life and social participation. Conversely, several studies emphasise that the recognition of tacit and implicit knowledge is central to understanding lifelong learning processes and promoting forms of substantive educational equity (Costa, 2016). It is in this context that criticism of epistemic hierarchies takes on an ontological significance, highlighting the need to rethink education not as a set of formal devices, but as a relational field of differentially recognised practices and knowledge.

The selective nature of these hierarchies is particularly evident in assessment and certification mechanisms. Skills developed in informal work contexts, care economies, migration circuits or illness and disability pathways are unlikely to be recognised in official assessment and certification mechanisms (Silva & Porto, 2022). Even where policies for the recognition and validation of informal learning exist, access to these tools remains unequal and particularly problematic for people living in conditions of structural vulnerability () (Colley et al., 2006; Rambla & Kovacheva, 2021). The literature also shows that such policies, although oriented towards inclusion, tend to favour areas related to employability and the labour market, neglecting knowledge acquired in family, community and everyday life contexts.

The result of these dynamics is twofold. On the one hand, knowledge assets that are relevant to social cohesion, innovation and collective capital are dispersed, remaining on the margins of institutional recognition circuits (McConkey, 2004). On the other hand, the subjects who possess this knowledge are frequently represented as 'bearers of needs' rather than as producers of knowledge, with symbolic, political and educational effects of exclusion that directly affect their possibilities for agency and participation (Babu et al., 2025; Omodan, 2023). What I mean to emphasise is that epistemic injustice does not only concern unequal access to knowledge, but also affects the very ways of

knowing and being recognised as legitimate epistemic subjects, taking the form of epistemic oppression (Dotson, 2014).

Countering these dynamics requires a profound rethinking of pedagogies and educational devices, oriented towards the enhancement of the co-construction of knowledge and the recognition of the epistemic potential of all subjects, including — and above all — in informal contexts (Boni & Velasco, 2020). This requires the adoption of humanising pedagogical approaches, capable of interpreting vulnerability not as an individual deficit, but as a shared relational condition and a possible source of critical and transformative knowledge (Christodoulidi, 2023; Huzar, 2025).

5. Learning ecologies in vulnerable contexts

Observing vulnerable contexts through the lens of informal education allows us to talk about real learning ecologies and to understand the shift in perspective from a school-centric model to a conception of education as a distributed phenomenon. In a refugee camp, for example, school interventions promoted by international organisations coexist with peer exchanges in informal spaces, family care practices, religious rituals and media consumption that transmit values and skills. In urban neighbourhoods marked by poverty and segregation, learning is distributed among community spaces, youth networks, social networks and informal economies. In health emergencies, children and adults learn new languages, rules of behaviour and ways of managing risk through a combination of institutional messages, community practices and daily adaptations. These ecologies show that education is distributed: it does not belong to a single institution, but is constructed in the intertwining of actors, places, artefacts and discontinuous temporalities; focusing on them implies redefining the very boundaries of what is recognised as education, overcoming the almost automatic coincidence between 'educational' and 'scholastic'. In this sense, the concept of 'learning ecologies' resonates strongly with different areas of educational research, because it allows us to recognise learning as distributed across heterogeneous social and material configurations and, at the same time, to critically question the criteria by which some learning becomes visible and legitimate while other learning remains marginal.

A minimal example: in a reception centre, understanding procedures (health appointments, document requests, interviews) is often learned through peer 'tutorials', WhatsApp groups and informal language mediation; these exchanges produce operational skills and, at the same time, forms of mutual recognition. In ecological terms, learning emerges from the alignment between artefacts (messages, forms, translations), relationships (peers, volunteers, mediators) and institutional constraints. Precisely because learning is distributed and multi-situated, these ecologies make it possible to observe the 'thresholds' of recognition that select which practices and which knowledge are translated into legitimate learning and which, on the other hand, remain invisible or downgraded, reproducing the epistemic hierarchies discussed above.

This perspective is closely linked to what was discussed earlier regarding informal education as a primary form of learning for survival, continuity and agency (Cino, 2020; Rückert & Moreira, 2020), showing how these functions unfold through chains of resources and relationships that extend beyond the classroom and the institutional boundaries of formal education. This is, in fact, a clear example of how education extends far beyond school, integrating resources and social actors to address new needs and shaping forms of educational support that span territory, institutions and social networks (Scialdone et al., 2022). Parental involvement, especially in situations such as the pandemic, has also highlighted the importance of informal home learning for children's development (Infantino, 2021), confirming that learning ecologies include everyday practices and living environments that take on a decisive educational value when formal pathways are interrupted, inaccessible or insufficient.

Within these ecologies, a specific role is played by micro-practices of resistance and forms of mutual aid that people develop even in highly hetero-directed contexts. Such practices are a vital component of learning ecologies because they teach people to read contexts critically, negotiate margins of autonomy and imagine alternative trajectories, contributing to empowerment and resilience (Vaccarelli & Zizioli, 2023). It follows that the ecological perspective allows us to grasp both the socio-material distribution of education and the dynamics of recognition that run through its circuits, paving the way for the next reflection on the relational ontology of education.

6. Towards a relational ontology of education

The perspective of learning ecologies and the analysis of the epistemic hierarchies that regulate the visibility of knowledge make the following ontological shift easier to understand: education cannot be thought of solely as a set of formally defined and institutionally circumscribed activities, but as a relational field of practices and meanings. What I argue is that education is not an intrinsic property of certain actions or devices, but rather an emergent quality that manifests itself when specific practices are recognised — by the subjects involved and by institutional contexts — as producing learning, orientation and transformation. Education thus appears as a distributed process, constructed in the dynamic intertwining of actors, places, artefacts and discontinuous temporalities, according to a logic similar to that of learning ecologies (De Simone & Papulino, 2023).

A relational ontology of education allows, first and foremost, for the inclusion in the educational gaze of forms of learning that develop in the fractures and margins of formal systems and which, precisely because of the thresholds of legitimacy discussed above, are often invisible or undervalued. This implies recognising the value of knowledge and skills acquired through observation, imitation, experimentation and adaptation in unstable contexts, such as managing subsistence economies, informal care or navigating complex bureaucracies. Although such learning is central to daily survival

and the exercise of agency, it is rarely recognised in traditional education systems (Cino, 2020; Rückert & Moreira, 2020).

This relational perspective also allows us to critically question policies and mechanisms that continue to measure educational success almost exclusively in terms of school attendance, standardised results or the acquisition of closed skills. Such criteria, based on established epistemic hierarchies, tend to marginalise experiential and contextual knowledge, contributing to persistent forms of epistemic injustice (Omodan, 2023). The exclusion of this knowledge from assessment and certification processes not only leads to a dispersion of relevant knowledge assets, but also to the representation of those involved as passive recipients or targets of interventions, rather than as producers of knowledge, with consequences of symbolic and political exclusion.

On the contrary, a relational ontology of education invites us to recognise as fully educational skills that are often overlooked in dominant assessment models, such as maintaining meaningful relationships, processing uncertainty, managing vulnerability and co-constructing socially liveable worlds. These skills are crucial for processes of resilience, integration and participation, particularly in contexts marked by structural precariousness (Velásquez et al., 2013; Birhanu & Sala, 2025).

Finally, looking at education from the perspective of vulnerable contexts does not mean limiting it to such situations, but rather using them as a critical lens through which to rethink education as a whole. The questions that emerge from these contexts — who is recognised as a learner, what knowledge counts, what forms of dependency are accepted or denied — also permeate mainstream educational institutions and challenge their implicit assumptions. In this direction, a systemic approach is needed that is capable of recognising and integrating the educational resources present in families, communities and territories, bridging the gap between formal and informal practices and promoting forms of educational co-design based on reciprocity and recognition (Iglesias Vidal et al., 2020).

7. Conclusions

In this article, I have argued that focusing on informal education in contexts of vulnerability allows us to bring to light dimensions of learning that are often overlooked by mainstream educational analyses: the centrality of relationships, the materiality of spaces, the affective and narrative dimension of experience, as well as the forms of agency that develop even in conditions of severe constraint. Recognising these processes implies broadening the ontology of education to include the everyday worlds of those who live on the margins of formal systems and to recognise practices that exceed the institutional boundaries of school as educational. On a theoretical level, this perspective invites us to overcome rigid dichotomies between formal, non-formal and informal learning, proposing an interpretation of education as a distributed process, articulated in circuits, transitions and interdependencies between actors, places and heterogeneous temporalities. In this framework, learning cannot be understood

exclusively as the individual acquisition of skills, but as a relational practice that is constructed through social interactions, material contexts and biographical trajectories, questioning evaluation criteria based solely on standardisation and measurability.

From this perspective, the proposed framework clarifies how informal learning becomes structurally relevant in contexts of manufactured vulnerability and why its epistemic status is often fragile. By linking vulnerability, three functions of the informal (survival, continuity, action), epistemic (in)justice and learning ecologies, the article offers an interpretative architecture capable of making visible both the productivity of the informal and the mechanisms through which it is filtered, devalued or erased. From this chain descends the ontological proposal: education should not be thought of as individual possession or as the exclusive property of formal institutions, but as an emerging relational effect, shaped by recognition, access and socio-material configurations.

This has three implications. For research, the unit of analysis shifts from individual subjects to relational configurations: networks of people, institutions, artefacts and practices within which learning and recognition circulate. For educational practices, the framework supports recognition-oriented interventions—spaces, languages, and procedures that legitimise experiential knowledge without appropriating or normalising it. For policy, it suggests that educational justice in vulnerable contexts requires attention to institutional filters: rules of access, credentialing logics, service design, and assessment regimes that systematically privilege some forms of knowledge while marginalising others. The political implications of this shift are therefore equally relevant in terms of : rethinking education starting from vulnerable contexts calls for the construction of educational and social policies capable of valuing situated knowledge, opening effective channels for the recognition of informal learning and making such devices truly accessible to those living in conditions of structural vulnerability. This requires a change of perspective that recognises people not as mere recipients of compensatory interventions, but as subjects with knowledge, skills and educational resources.

In this sense, vulnerable contexts are not marginal exceptions, but become epistemically fertile places from which to critically question the implicit assumptions of contemporary education. The co-design of educational interventions together with the people directly involved and their communities emerges as a crucial condition for combating persistent forms of symbolic and epistemic exclusion. attention to informal practices and learning ecologies present in the territories thus opens up the possibility of imagining more equitable, inclusive and transformative educational models, capable of responding to the complexity of life experiences and redefining, in a more pluralistic way, what is recognised as 'education'.

Within this same theoretical framework, the metaphor of the syncytium can be made more explicitly heuristic: it helps to visualise the trajectory described by the framework in five steps, showing how the vulnerability produced (1) and the functions of the

informal (2) lead, through thresholds of epistemic (in)justice (3) and ecological configurations of learning (4), to a relational ontology of education (5). In biology, 'syncytium' refers to a cytoplasmic continuum, often multinucleated, in which the boundaries between cellular units are attenuated or reabsorbed (e.g. by cell fusion or nuclear divisions not followed by cytokinesis): this makes it possible for a local event (damage, a signal, an adaptation) to propagate throughout the system, producing effects that are not limited but distributed. Transposed to the educational sphere, the metaphor does not serve to 'naturalise' social phenomena, but rather to describe a recurring property of learning ecologies in vulnerable contexts: the rapid and non-linear circulation of resources (information, care practices, survival skills, implicit norms) through networks of relationships that span family, peers, community, services and digital environments. Reading in terms of syncytium means, operationally, shifting the focus from individual outcomes to mechanisms of propagation: how situated learning, a micro-practice of agency or a routine of mutual aid is adopted, adapted and amplified along relational chains, generating resilience as an emerging and collective property rather than an individual attribute.

At the same time, the analogy must be handled with caution and its limitations acknowledged. Unlike biological syncytia, educational contexts are not borderless spaces: there are institutional, legal and symbolic 'membranes' that regulate access, recognition and legitimacy of knowledge, and these membranes can be as protective as they are exclusionary. Furthermore, interdependencies are not neutral: they are traversed by power asymmetries, selections and epistemic hierarchies that can interrupt or distort the circulation of educational resources. Taken as a controlled metaphor, however, the idea of syncytium helps to conceptualise informal education in vulnerability as a field of interconnections and reverberations, in which educational quality resides not only in the intentions of formal devices, but in the web of relationships and transitions that makes learning possible (or prevents it).

The contribution has limitations: it offers a conceptual synthesis rather than a systematic mapping, and therefore does not claim to cover all relevant literature and contexts exhaustively. Future research should test the framework empirically by tracing where epistemic invisibility occurs along learning ecologies, identifying conditions in which the informal shifts from survival to action, and analysing which institutional designs enable recognition without reinforcing deficit frameworks. Taken together, these directions can consolidate an understanding of education as relational, distributed, and politically meaningful in contexts of vulnerability.

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