Rethinking Virtual Learning Spaces Through Architectural Metaphors: The *Hearth* in Postdigital Education

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Abstract: Since the start of time, space has enabled our existence and influenced our perceptions, values, and behaviors. The concept of *hearth* has shaped in architecture the way humans create community, grow, and learn around the central space of "fire." As we learned to inhabit our bodies, homes, and cities, we are now also called to engage in the digital world. What the *hearth* can enable in postdigital learning environments? Can the *hearth* affordances be translated digitally to redesign learning spaces? Advocating for an approach that prioritizes care and community over technological solutionism (Macgilchrist et al., 2023) in designing postdigital learning spaces, this paper draws from the architectural metaphor of the *hearth*, embracing a conceptual framework for reimagining and designing digital spaces – through *circularity, safety and community* – inspiring educators, architects, community builders, and designers to collaborate on the creation of innovative digital learning environments.

Introduction

Space is one of the fundamental dimensions that – as a three-dimensional construct – not only enables our existence but also profoundly influences our perceptions, behaviors, and how all living and non-living entities inhabit the world, remaining an essential part of shaping our experiences (Mocrei-Rebrean, 2022). Our embodied relationship with space has been central to our survival, skills, and psychology: we inhabit our bodies, our homes, our cities, and the environment around us as a whole.

With the emergence of the digital world, the spatial paradigm has shifted significantly, shaping new perceptions, behaviors, relationships, and educational models. New challenges are introduced: How do we learn in the digital environment? How to foster meaningful connections and experiences in digital learning?

Currently, digital spaces are designed with a technical engineering approach (Macgilchrist, 2023), lacking the communal and relational affordances of physical spaces (Willermark & Islind, 2022). This is particularly relevant in the educational field, where the rapid shift to digital is still far from reflecting and embedding critical elements of how we already inhabit places and learn in them – in a purely human experience.

This paper aims to navigate those challenges, exploring with a narrative literature review the concept of *hearth* and affordances in postdigital learning environments.

Rather than prescribing a specific implementation model, it proposes a conceptual framework that highlights key spatial, psychological, and communal affordances that should be considered when designing digital learning spaces. Given that the translation of the *hearth* into digital environments is a relatively unexplored area in the literature, this

theoretical exploration serves as a foundation for future research and practical applications.

Theoretical framework

1 Hearth, *spaces, and sense of place.*

Entangled with our nature, the concept of space – in its abstract form and broader sense – is the psychological or physical environment that surrounds us and remains "emotionally neutral" as it is perceived as a series of disconnected locations (Mocrei-Rebrean, 2022). Instead, the sense of place emerges when a lived environment is embedded with people's interactions, shared experiences, and connections (Claisse et al. 2024). The transition from these abstract spaces into meaningful "lived places" is reflected in the *hearth*, which in an experiential engagement enables to transform the environment into a "space of human activity", rich of emotional, perceptional, sensory and symbolic significance (Mocrei-Rebrean, 2022).

Being a metaphor itself, the *hearth* takes its name from the physical space that hosts the fire in the fireplace, becoming, only later with modern spatial research, an archetype of the architecture of dwelling (Alfano, 1997 in Furnari, 2020). While it symbolizes the primitive attachment of humans to fire for their survival together with comfort and safety (Zografos, 2019; Anderson et al., 2013), the *hearth* was a place for communal experience, where the private and public spheres blended in a space that was simultaneously home, temple, and school (Alfano, 1997). Thus, the *hearth* represents the "center" not only of the household but also of communities' social life (Anderson et al., 2013; Alfano, 1997).

Wishart in Anderson et al. (2013), navigates through the spatial and symbolic meanings of the *hearth* in vernacular architecture, highlighting that its socio-cultural aspects and values are translated on a structural level within the circularity of space (e.g. conical lodge or Greek *oikos*: Furnari, 2020), where it – being either the hut interiors or the yard – exalted the collectivity of indigenous traditions.
During and after the Industrial Revolution in Europe, the concept of *hearth* was neglected in favor of progress and individualism. In a critical response to this crisis of values, architects such as F.L. Wright, L. Kahn, and A. Aalto re-centered the spatial research of the home conceptualizing the *hearth* – both physically and symbolically – as a communal place to share, learn and grow (see Curtis, 1996).

Whether as a fireplace or as a central space around which the entire structure develops, the *hearth* anchors not only our perceptual connection to the environment but also our cognitive understanding of it, within which its relational features enable our collective learning experience of the world.

2 Educational affordances and needs of the postdigital environment.

If we use Knox's (2019) perspective on the term postdigital, it does not only denote a period "after" the digital but rather how humans and technology interact and shape the future society will go towards.

In a context where digital technologies are embedded within society (Knox, 2019), online learning environments are characterized by instability, hybridity, and continuous

evolution, merging simultaneously different dimensions (Ball & Savin-Baden, 2022). Called to renegotiate physical boundaries between public and private (Willermark & Islind, 2022; Ball & Savin-Baden, 2022), educators and learners navigate continuously these postdigital landscapes, adapt creatively, and explore different learning design models (Gachago et al., 2023), whose affordances – as potential for action in specific environments (Gibson, 1977 in Willermark & Islind, 2022) – highlight both the opportunities and limitations of virtual classrooms.

According to Willermark & Islind (2022), educational affordances in digital learning environments favor formal interactions based on one-on-one communication, individualization, hidden back channels against bonding, structured educational models. They also demand throughout planning and generate complicated classroom dynamics, marking challenges in hosting holistic engagement that risks overlooking the collective learning experience.

Importantly, the literature reveals that spaces themselves do not guarantee learning and, while they provide a place to be together, it is the interactions and connections within them that generate the learning experience (Massey, 2005 in Gravett et al., 2022; Kennedy, 2018; Wardak & Wilson, 2024). This perspective challenges the notion of learning spaces as neutral, static, or purely physical but encourages to view educational digital spaces as fluid and entangled in a multiplicity of dynamic experiences (Mocrei-Rebrean, 2022), that should have connectedness and community at their core (Whiteside, Dikkers, & Swan, 2017; Kennedy, 2018).

The *digital hearth*: a conceptual framework

Despite the lack of embodied presence can weaken interpersonal bonds in digital education, understanding environments as relational and entangled offers opportunities that truly support learning and connection.

The current literature recognizes connectedness and community as crucial elements of the learning experience; however, it lacks a holistic approach to implementing spatial collective engagement into digital learning, a deep inquiry onto how social presence affects trust and psychological safety over time, and how to overcome a passive participation in the digital space.

The Community of Inquiry (CoI) framework developed by Garrison, Anderson, & Archer (2000) emphasizes the intersection of relationship-based interactions, social presence, and social learning theories as enablers of emotional connectedness, encompassing a sense of safety and trust that might lead to a sense of community in an online learning space (Kennedy, 2018), but overlooks spatial affordances and how digital environments shape connection. Alternatively, the relational framework underlines how spaces and places foster connection, yet remains bound to the physical environment (Gravett et al., 2022).

The conceptual framework of the digital *hearth* aims to bridge this gap by asking: “What the *hearth* can enable in postdigital learning environments?” and emphasizes the need for digital spaces to intentionally replicate the spatial-relational affordances of physical spaces – *circularity*, *safety*, and *community* – providing us with the opportunity of “shaping the substance of the space” based on what they can afford us and on the perceived uses of the environment (Betsky, 2015).

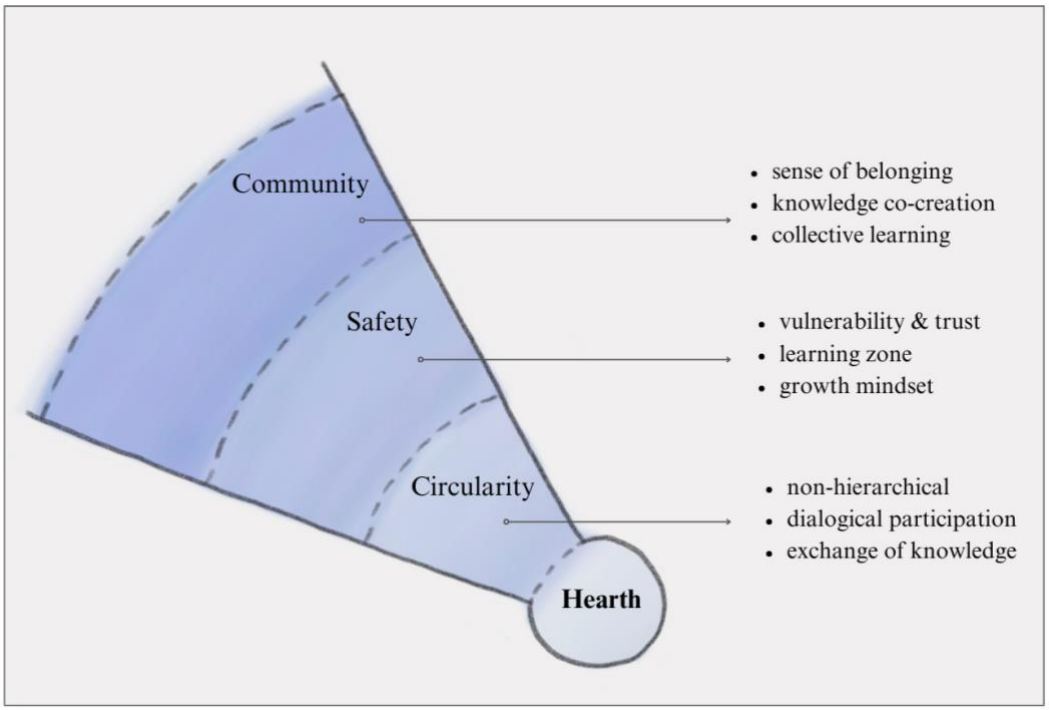

Figure 1. Digital hearth conceptual framework

Circularity.
The physical *hearth* functions as a central node, that – enabling storytelling – becomes in the digital context a dynamic center around which multiple exchanges of knowledge and interactions occur simultaneously, transforming a heartfelt atmosphere into a collective, holistic learning experience. Questioning hierarchical dynamics and proposing equality between educators and learners, circularity aligns with existing theories of dialogical participatory learning by fostering interactions, connectedness, and social presence (Whiteside et al., 2017; Kennedy, 2018).

Safety.
Online learning often challenges traditional interaction styles, resulting in a sense of distance and difficulties in engaging and participating (Willermark & Islind, 2022). In social pedagogy theory, learning occurs between the comfort zone and panic zone (ThemPra n.d.), making safety a crucial element for the learning experience (Willermark & Islind, 2022; Claisse et al., 2024), built through dialogue, acceptance, equality. The *hearth*, associated with fire, affords safety (Zografos, 2019; Anderson et al., 2013), but also its risks. Building safety requires vulnerability and trust, nurturing an environment where learners feel psychologically safe to explore and fail (Garrison et al., 2000; Whiteside et al., 2017) while connecting with peers and cultivating their growth mindset (Dweck, 2017).

Community.
Throughout history, physical communities were built around the concept of the *hearth* (Mocrei-Rebrean, 2022; Anderson et al., 2013), and – despite the factors enabling a sense of belonging in digital spaces are difficult to quantify – community remains pivotal to the learning process. Community can be built when non-hierarchical safe spaces built on dialogue generate ultimately a sense of place and belonging (Freire in Heiskanen et al.,

2022), supporting collective intelligence through peer interactions, knowledge collaboration and co-creation, aligning with the CoI's cognitive presence (Garrison et al., 2000) and the theory of Communities of Practice by Wenger (1998; Kennedy, 2018), which highlights that online communities thrive when individuals feel agency and emotional investment in shared knowledge creation (Bovill, 2020).

Table 1. Digital hearth conceptual framework: relations with in literature and its gaps.

	Relations to existing literature	**How it fills the literature gaps**
Circularity	Supports social presence by fostering dynamic, continuous exchanges of knowledge and interactions (Garrison et al, 2000) while recognizing space as relational (Whiteside et al., 2017; Kennedy, 2018).	Addresses the gap of spatial affordances and participatory engagement by connecting dialogical learning and non-hierarchical exchanges in a special organization.
Safety	Recognizes the importance of safety to explore, fail, and engage (Garrison et al, 2000; Whiteside et al., 2017) for the learning process.	Allows to create environments that integrates social pedagogical practices in building psychological safety and trust over time, as part of the digital learning space design.
Community	Sees cognitive presence as enabler of collective learning while emphasizing belonging (Wenger, 1998; Garrison et al., 2000; Kennedy, 2018).	Aims to overcome the transactional over relational focus of digital design, addressing active participation and engagement for online learning.

The implications of the digital *hearth* lie in shifting the focus from function-driven environments to digital spaces that actively support connection and presence – challenging the dominance of technological solutionism (Macgilchrist et al. 2023) and advocating for a human-centered approach in online learning design.

Just as physical *hearths* have historically served as communal gathering points, digital *hearths* can act as dynamic centers for dialogue and shared exploration of knowledge by creating flexible spaces that encourage community building. Yet, the framework remains at a conceptual level and would benefit from further research and empirical validation – exploring how learners perceive and interact with such spaces, and whether specific design interventions enhance dialogical engagement, trust, and community building.

Existing online community hubs and virtual co-learning platforms offer an example of the importance of space in shaping human interaction and collective learning – being often designed to engage in discussions, peer mentoring, and collaborative knowledge-building (e.g. Discord). Additionally, online communities such as virtual study groups or co-working spaces can function unintentionally as digital *hearths*, as spaces for co-creation and collaboration. However, replicating this in educational contexts might require additional inclusive moderation practices, as online learning platforms may fail to enable co-creation and active participation (e.g. Coursera).

For instance, designing for circularity that nurtures psychological safety may involve rethinking the digital space and platforms through trust-building mechanisms, and co-

creative participatory discussions rather than linear, instructor-led interactions. Furthermore, design choices that prioritize dialogical engagement over passive content consumption and rigid structures could replicate the sense of community built around *hearths*.

Conclusion

Whether physical or symbolic, every place with a *hearth* allow us to learn and grow in an active collective engagement. The *digital hearth* framework invites us to rethink online learning environments as spaces that can prioritize learning through human connection, by bridging spatial theory, relational affordances and social presence from existing literature.
As learning environments become increasingly hybrid, designing digital spaces that afford *circularity*, *safety*, and *community*, grants the possibility to move towards an educational model that is technologically advances while also deeply relational and inclusive, where online learning happens not in an isolated, transactional environment but in a fluid space.

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