

Food for thought: an analogy for digital sovereignty in education

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Abstract: Digital sovereignty (DS) in education refers to the educational community's capacity to exercise self-governance over technology use, aligning it with educational goals. Many educators, with limited familiarity with critical digital literacy, struggle to represent technological issues using domain principles and values, restricting engagement with its ethical, environmental, and agency-focused principles. This paper proposes using food sovereignty principles as an analogy to foster abstract representations by linking DS to a familiar context.

Background

The advancement of Information and Communication Technologies (ICT) requires education to adapt while considering significance to its broader educational agenda. Educational values support an inclusive, critical and community-focused approach to ICT that prepares students to engage critically with it, but are limited by understandings that shadow its non-neutral impacts.

The view from the philosophy of education

We build upon research that conceptualizes the educational system as an emergent complex system whose direction and momentum – ideally shaped by its purpose - arise from the coordinated evolution across three realms: symbolic, individual, and political (Osberg & Biesta, 2021). Each of them is influenced by technological transformations: in the way we acquire and use knowledge (symbolic realm) – including infrastructure, resources, pedagogies or technologies -, the way we form identities and exercise agency (individual), or the way we live together in society (political) – including the role of education in technologically advanced societies. Educational outcomes are contingent upon the interplay between these three distinct realms. For example, the integration of ICT within educational contexts presents a dual potential. While ICT can facilitate expanded access to knowledge, thereby fostering individual agency and promoting diverse perspectives, it may also inadvertently introduce biases and diminish diversity. This latter effect arises from the challenges associated with navigating extensive information repositories and the inherent subjectivity involved in determining the value and validity of knowledge sources. The complex interplay of educator and policymaker conceptualizations and engagements with these transformations, frequently mediated by external stakeholder influences, especially from large technology corporations with multi-scalar operations in education and related sectors, ultimately shapes the emergent outcome.

Digital sovereignty (DS) in education

We define DS in a broad sense, as the capacity for deliberate and reflective action in socio-technical contexts, acknowledging the inherent power dynamics in ICT interactions and their influence on the self-governance of society (Stefanija & Pierson, 2023). Drawing upon these observations, we define Digital Sovereignty (DS) in education as the educational community's capacity for agential action and self-governance. This capacity ensures that the integration of ICT within the three interconnected domains, and their interactions, aligns with the fundamental purposes of education and the lived experiences of the community. DS addresses processes such as heightened datafication, including extractive dynamics, the automation or technological mediation of social interactions, and other related phenomena, all within a context of escalating industrial expansion and concentration (Sriprakash et al., 2024).

The impact of critical digital literacy in education

Discourses in critical literacy studies acknowledge that a critical approach lacking substantive knowledge and understanding may prove unproductive (Ilomäki et al., 2023). Ostensibly neutral technological definitions can lead to non-neutral policy and attitudinal shifts (Blikstein & Blikstein, 2021). Previous research suggests that teachers with limited ICT knowledge conceptualize technology differently from more expert ones, using more idiosyncratic and contextual information, at a lower level of abstraction (Economou et al., 2024). These differences between experts and novices are also observed in other domains (Goldwater et al., 2021). A democratic approach requires providing non-technical experts with domain information to build relevant conceptual frameworks that are consistent with their interests (Krafft et al., 2020).

Self-efficacy in teachers

Self-efficacy refers to an individual's confidence in their ability to succeed in a situation. Self-efficacy influences student learning by affecting motivation and outcomes (Waddington, 2023). Teachers' ability to draw connections within areas where their self-efficacy is higher is anticipated to support their learning in critical ICT use.

Analogical thinking in education

The understanding of situations is influenced by one's prior knowledge (Raynal, 2022). A limited understanding of ICT can lead to overlook levels of abstraction needed to interconnect the effects of ICT, that can subtly influence and reshape educational values on its own right in unforeseen ways. In learning theory, the process of reframing existing understandings to incorporate more accurate or complex perspectives – such as shifting misconceptions like ICT's neutrality – is described as conceptual change (diSessa & Sherin, 1998). In this learning context, analogies have been studied as means that can help promote conceptual change, by relating new experiences to familiar ones. Analogies have the potential to facilitate a deeper understanding of ICT's educational impact by bridging surface-level knowledge to structured comprehension.

Analogies help explain the unfamiliar by comparing it to a familiar area that shares a common structure (Gentner, 1983), and used in areas such as problem solving (Ross, 1984), the explanation of scientific contents and science learning (Glynn, 2015), or social judgment in new situations (Mussweiler & Rüter, 2003). Analogies provide a means to explore an unknown concept through the parallels with known concepts from an area that, and are present in multiple processes in human cognition, Analogies guide technology governance by shaping innovation, policy, and academic perspectives through issue framing and feasibility perceptions. (Maas, 2023).

The process of analogical reasoning relies on identifying consistent commonalities between two representations. Analogies can be useful or misleading, depending on the quality of the inferences provoked. Effective analogies promote a more abstract representation and the generation of new knowledge about the target situation when inferences provoked are clear, relevant, and factually accurate (Gentner & Smith, 2013), especially with superficially dissimilar analogies (Raynal, 2022). Analogical learning is fostered through this inference projection, but also schema abstraction (generalization), contrast (detection of differences) and re-representation (Gentner & Smith, 2013). This last aspect is of special interest for our case, as teachers may not establish relations between the use of ICT in education and other domains of their work, or establish wrong analysis, such as the mapping of ICT with other passive tools. When it is suggested that initially disparate connections should align, analogies contribute to abstraction by an adjustment that offers alternative means (Raynal, 2022).

The analogy with food sovereignty

Food is a pervasive element in education, both an object of study and a central component of daily activities. Individual educators and policy making generally endorse choices that aim at instilling habits promoting students' health, environmental awareness, economic and cultural understanding, and social integration that align with sustainability and community well-being. They typically possess foundational knowledge about the broader societal roles that food-related practices serve, and make efforts to integrate food-related activities that reflect the school's values, within the constraints that aspects such as budget can impose, serving as a vehicle for nurturing critical awareness regarding the social and environmental unsustainability inherent in the prevailing food system.

The food sovereignty (FS) movement emerged as a response to the perceived commodification of food and the complex multifaceted social, economic, and environmental crises precipitated by contemporary models of food and agriculture (Wittman, 2011). While FS encompasses diverse meanings, at its core, it represents a rights-based approach, aiming to safeguard individuals' capacity and entitlement to define their own models of production, distribution, and consumption, associated with the right to food and food justice, and linked to culture, heritage, and worldview (Dekeyser et al., 2018). FS formalizes many aspects that teachers consciously or intuitively use, resonates with their educational goals and, whether explicitly articulated or under alternative frameworks such as sustainability, holds presence within educational institutions (Koch, 2016).

While ICT decisions can facilitate community consensus, promote well-being, mitigate environmental impact, and uphold diversity, this systematic approach is often lacking in education, such as with the open-source movement, where teacher engagement is limited. Explicit guidance of analogical inferences, ensuring accurate similarity mapping and goal relevance, helps guarantee the adequacy and correctness of derived inferences. A proposal of structural similarities can be found at <https://zenodo.org/records/15108346>. A dual approach - focusing on both conceptual shifts and specific practices can support achievable change, supporting the gradual shift, making long-term change more achievable and less overwhelming. This dual approach resonates with findings on teacher's views on critical reflection (O'Flaherty et al., 2024). Future critical digital literacy training should clarify structural elements for insight development of insights on ethics, environmental impact, and critical skills, and provide educators early in their training with frameworks that promote a critical ICT analysis.

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Acknowledgments

Supported by PID2020-112584RB-C33, PID2023-146692OB-C33, CEX2021-001195-M funded by MICIU/AEI/10.13039/501100011033, UPF-CLIK, SGR00930. DHL acknowledges ICREA Academia support.