Original Paper

A New Phase in the History of Education for Sustainability. The Emergence of Territorial Education in a Post-Covid Recovery Period

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Abstract

The current pandemic has acted as a catalyst for chain reactions on issues such as the decline of certain industries, job losses and problems of food transportation. In a "globalized world", connections require re-organizing. More than ever, the economic, environmental and social un-sustainability of our cities is exacerbated. Education for sustainability could help societies to address such vulnerabilities and recover from the pandemic.

With a focus on cities, this article explores the emergence of "Territorial Learning" (TE). It illustrates the importance of taking the (geographical, cultural and socio-economic) context into account when contributing to education for sustainability as well as the operationalization of this concept and the identification of strategic priorities, participants in the learning process, and skills needed to ensure that learning outcomes lead to actions that will facilitate the transition to more resilient societies.

The article explains the recent emergence of TE and its links with education for sustainability and global citizenship. It then illustrates how TE can help in dealing with two urban priority issues (food security and urban governance) and develop skills for sustainability. Finally it suggests some areas for future research, if TE is to help with the recovery of post-pandemic cities.

Keywords

Territorial Education, skills for sustainability, resilient cities, food security, participatory urbanism

1. Introduction

The focus of this article on education for sustainability is *Territorial Education* (TE)—an approach that highlights the importance of the context within which learning is taking place, not only from a

bio-geo-physical perspective, but also from a socio-economic and political one. In all initiatives on new educational paths for sustainability, research has demonstrated that sustainability-oriented programs could not be successful unless people directly concerned by them were also involved in their design and running (Healy et al., 2013). This implies an appropriate size of activities, at a manageable scale. This conclusion emerged from decades of discussion, research, work on official texts and declarations, aimed at identifying how the education system could play a role in transforming our societies into more sustainable ones. It was also boosted by the various crises we have been recently going through (e.g., the Covid pandemic, which has itself exacerbated the effects of climate change, or "The coming food catastrophe"—May 2022 issue of The Economist), that led many to question globalization and its effects (Innerarity, 2020). Within the educational system itself, doubts have also been raised concerning the effects that education for sustainability have had, in practice, so far. High skepticism is accompanied by a strong will to keep on improving the impact that education at all levels, be it informal or formal, can have on improving the situation. Fien (2020, p. 1), who explored the history of environmental education over the past 30 years, showed that "student levels of awareness of key concepts for sustainability are low, with few able to correctly define such essential concepts as the precautionary principle and sustainable development which underpin sustainability". Yet, education is still viewed as the prerequisite to achieving Sustainable Development Goals (Kioupi & Voulvoulis, p. 201; Lewin, 2019). However, "ambitious initiatives to transform education for the 21st century in order to (re) introduce concepts of-and skills for-environmental protection and sustainability are going to require enlightened leadership and governance structures for scalable, system-wide reform" (Howard et al., 2019, p. 1).

Table 1 summarizes the historical background regarding the evolution of education for sustainability and helps in understanding where we currently stand.

Taking the city as our territory of interest, we investigate here to what extent TE could provide an appropriate participatory learning approach to operationalize sustainability principles and make cities more resilient. The article explains the recent emergence of TE and its links with territorial development, global citizenship and education for sustainability. It then illustrates how practicing TE relates to building resilience in cities—in particular, how it can help us to deal with two priority issues that are of particular relevance in post-pandemic cities (food security and circular economies) and how it can equip learners with skills that are appropriate to facilitate a societal transformation towards sustainability. Finally, two areas for future research are suggested if TE is to help with a broader recovery, in a post pandemic world: linking TE and citizen science to strengthen urban food security, and integrating TE into urban governance to encourage and monitor circular economies.

Table 1. Historical Background: From Environmental Education to Education for Sustainability

	Main characteristics	Conferences and events	Key publications
Environmental Education **(EE)** in the 1970s	EE related to the rise in environmental movements. Although described as interdisciplinary, and socio-economic and political dimensions of environmental issues were discussed at Tiblisi, EE was mainly focused on helping students to understand better the natural environment from a scientific perspective. Broader understanding of issues is at stake at the end of the 1980s.	EE was first mentioned in Stockholm, at the 1972 United Nations conference on the human Environment during which the establishment of the International Environmental Education Program was recommended. 1974 UNESCO-UNEP Inter-national Workshop on EE in Belgrade 1977 Tbilisi Intergovernmental conference on Environmental Education.	The first journal of EE was published in the United States in 1969. UNESCO-UNEP (1978) Tiblisi declaration. Keong, C.Y. (2021)
Education for Sustainable Development **(ESD)** **1980s- now**	For UNESCO, Education for Sustainable Development (ESD) involves integrating key sustainable development issues (such as climate change, disaster risk reduction, biodiversity, …) into teaching and learning. Rising tension between ESD and Development Education—DE. As the concepts of sustainable development and sustainability evolved, however, it became clear that DE and ESD cannot be easily separated.	1987: The World Commission on Environment & Development (WCED)- Brundtland Commission-defines sustainable development as "a type of development that meets the needs of the present generation without putting at risk the capacity of future generations to come in meeting their own requirements". How to operationalize such development was discussed at UN conf in Rio (1992).	Agenda 21: first international document that identified education as an essential tool for achieving sustainable development (UN, 1992). (40 chapters). One main report was published at the end of the DESD (Buckler & Creech, 2014). Sustainable development goals: SDG (UN, 2015) Relationship between ESD and DE: UNDP

		2002: Johannesburg UN Summit. Decade of ESD (2005-2014): DESD. 2015: Sustainable development goals identified.	reports (UNDP, 1992; 1998; 2003; 2007); Berlin declaration ESD 2030 UNESCO 2021
Neo-liberal "reforms of the education system' **G**lobal **E**ducation **R**eform **M**ovement **(GERM)** **1990s**	Global reform aimed at making schools more efficient, bringing them closer to the ICT & adapting educational institutions to new globalised systems. EE and ESD got diluted. Standardization of teaching and learning. Paradigm of *"entrepreneur education"*	Program for International Student Assessment (PISA) carried out periodically by the OECD.	Fuller & Stevenson (2018); Saltman & Means (2018). <u>Critique of-:</u> Teodoro (2020), Santos (2006), and Sahlberg (1996)
Construction of Global Citizenship **E**ducation **(GCE)** **2000s-**	Discontent with globalization. GCE: sense of belonging to a broader community and common humanity. It emphasizes political, economic, social and cultural inter-dependency, & inter-connectedness between the local, national and global levels.	Guadalajara declaration 2004	UNESCO (2014); Bosio & Torres (2019)
Education for Sustainability **(EfS)** **2000s-**	Sustainability larger than sustainable development; is interdisciplinary and responds to people's needs. Links between human end ecological systems. Partnerships between educational institutions, public-private sectors +	**2008** University Summit Sapporo Sustainability Declaration. **2009** Turin Declaration Supporting sustainability at global and local levels. **2012** People's treaty on sustainability for higher education.	Tilbury, D. (2014). Cebrian et al. (2022) Wade (2011) Berlin declaration on education for SD-UNESCO (2021).

NGOs.

2. The emergence of Territorial Education (TE)

The multiple and complex links between education and territory are being progressively recognized and integrated into debates on education for sustainability although, as Boix et al. (2015) highlighted, "while the different contexts having influence on education—spatial, political, institutional, for instance—have been analyzed for a long time, *territoriality* has only really been tackled for fifteen years" (p. 12). It was after the 1990s that the territorial aspects of educational contexts were noticed concerning their systemic impacts on education. Yet, as Lahire (2012) emphasizes, no other notion is as essential to the reasoning of human sciences-and as neglected-as the notion of *context.*

In TE, teaching and learning are understood as dynamics that both can *adapt to* territorial specificities and can *contribute to* territorial sustainability, by helping to re-establish respect for an adapted relationship with the local territory without losing a global perspective (Boix et al., 2015). Numerous institutional networks have recognized this and have been mobilized in many countries and in all kinds of territories, to facilitate the integration of school in their territory, in line with programs on Education for Sustainable Development (Francis et al., 2011).

2.1 TE and Territorial Development

The relatively new focus on the context and local territory as a basis for education for sustainability (Kulikova et al., 2021) accompanies what Courlet and Pecqueur described as a "trust issue" with regards to the "*Etat-Nation*" (nation-state), in a somehow "post-normal paradigm" within which liberalism and growth models are being questioned (2013, p. 7). Attached more specifically to the notion of "territorial economy", these researchers describe "territorial development" as a "new grammar of economics" which seeks to contest the dogma of the "homogeneous space". Numerous French, Quebequois, Italian and Anglo-saxon contributions, encourage the emergence of "local and territorial development", explaining that the territory, as a complex system, is aligned with the deepest challenges of current societies. "The space of analysis, the territory, has to be approached *as a system* made of stakeholders linked by dynamic social ties and connected to the outside world" (Courlet & Pecqueur, 2013, p. 15).

It would be fair to say that the original interest in the *territory* was closely linked to the *theories of localization* which suggest that "the diminution of transportation costs amplifies the polarization of activities" (Courlet & Pecqueur, 2013, p. 35). Technically, sustainable development is taking our societies towards "new proximities", due to the requirements of recycling, energy saving and reclaim. In food systems, notably, traceability will be imposed and lead to a reinforcement of geographical and institutional proximity and a shortening of food chains linking producers to consumers.

This is not to be confused with the notion of *territorial cohesion* that was put forward when the Lisbon Treaty (1st of December 2009) came into force and that aims at "building bridges between economic effectiveness, social cohesion and ecological balance, putting sustainable development at the heart of

policy design" (p. 3). Although EEA (2010, p. 8) explains that "territorial cohesion should encompass the sharing of environmental responsibility and benefits among territories and throughout the EU", reflection on the economic contribution of the territory remains incomplete. And yet, as Courlet and Pecqueur (2013, p. 58) explain, "the territory plays an essential role in the start and unfolding of "development", considered itself as a long and continuous process. The key factors of development are historically rooted in the local social reality and are not easily transferrable and comparable with other spaces and territories". In effect, "development" appears to be more of a social process than a technical one. It includes the historical and cultural factors that are the basis of modes of production and of the continuous interaction between the economic and the social spheres (Buclet, 2011).

Making a territory more sustainable therefore has to result from a clear intentionality, an explicit collective project that marks the transition from a "top-down imposed history" to a "bottom-up constructed history".

2.2 TE and Global Citizenship Education

The relationship between territorial economies, governance and globalization is interesting in that, as Courlet and Pecqueur highlight, "whilst questions related to the governance of civil society and to sustainable development clearly encompass a global dimension, they also, paradoxically, require more and more proximity" (2013, p.17). The globalization movement does not necessitate a *homogeneization* of the economy of the planet, as Innerarity (2020) explained through his notion of *glocalization*. A global dimension that remains core to sustainable development relates to common values encompassed in the humanistic concept of Global Citizenship, defended for long by UNESCO.

Global Citizenship Education (GCE) emerged in 2012 as the first ever educational initiative of a UN secretary. It "refers to a sense of belonging to a broader community and common humanity and emphasizes political, economic, social and cultural inter-dependencies and interconnectedness between the local, the national and the global" (UNESCO, 2014, p. 14). If, as was asserted in the Guadalajara declaration (2004), we believe that education and knowledge are the most powerful tools for transformation, development, assurance of equality opportunities, social cohesion, and mobility, we should therefore adapt educational institutions and curricula so that they help societies and citizens in moving to a global type of citizenship that contribute to managing resources more sustainably. Such educational changes could work on a new inter-link between global citizenship and TE. Reinforcing this assertion, Teodoro emphasizes that "the requested type of citizenship of the 21st c. transcends traditional political and social levels and will be strongly cultural" (2020, p. 20).

In the continuity of educational reforms, TE suggests ways to get back to the UNESCO humanistic approaches to Global Citizenship Education, in view of updating our "knowledge and skill-gap" when it comes to understanding how sustainable communities could function in practice. Patricia Broadfoot, British sociologist and comparativist, criticized the OECD's approach of World Class Education as being "one size fits for all and uni-dimensional model of education". She defended a shift in paradigm to *place learning*—not achievements—at the centre of the comparative study setting. As she explained,

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"from this perspective, comparative studies may resort to contributions derived from scientific fields such as anthropology, neuroscience, political science, science engineering, or the arts to achieve a deeper level of understanding of the learning constants and contexts" (Broadfoot, 2009, p. 1260). As Teodoro explained, "we should consider a methodological strategy that enables us to take into account different levels of analysis, namely: the supra-national, focusing on international orientations of educational policies; the national, centered on specific cases of national member states and their interpretations and strategies of [more global] educational policies; the institutional, addressing specific educational institutions; and finally, the individual level of analysis, which allows us to explore the ways individuals deal with the changes taking place in educational policies" (Teodoro, 2020, p. 18).

Santos (2006), who talks of *alternative modernity* as a new way of understanding and apprehending the reality that surrounds us, explored the type of knowledge that is needed to improve our societies through his defense of varieties in "epistemologies of knowledge". In line with this, the concept of *human development*, put forward by authors such as Amartya Sen (2009) and Marta Nussbaum (2002), can help in transforming the educational system whilst allowing different ways of approaching learning and communication methods as well as social transformations that are context and cultural dependent.

Going even deeper in the critical analysis of blockages that have stopped societies from learning effectively about sustainability and putting the concept into practice, Launtensach (2011) advocated addressing the failures of education through the lens of *restorative justice*, and reforming educational systems, so that they move away from value-neutral curriculum and even aim at reformulating what constitutes *progress* "in order to stop teaching counterproductive beliefs—e.g., in unlimited growth, or the freedom from-and domination over-nature" (p. 8). This fits with principles of *liberating pedagogies*, designed to free the learner from the influences of dominant paradigms and to help empowering and motivating the learner to take action (Freire, 1986). This is because, "unlike the more passive transition to post-industrial society, achieving a sustainable society will require an active and transformative effort" (Barber, 1998, p. 196). The emergence of TE has highlighted the fact that many dimensions of sustainability (social, political, cultural, in particular) haven't been sufficiently addressed in EE, ESD and EfS. The current Covid crisis has called for urgent, practical, action and triggered new reflexion on "learning and doing" in order to transform our societies into more sustainable ones. The potentials of TE need to be explored in this context.

3. Territorial Education in Practice: Contributing to Post Covid-19 Recovery

In this second part, we examine how the themes that characterize TE (territorial development and Global citizenship education through restorative justice) relate to key components of the post-Covid recovery that cities will have to address (section 3.1). In order to initiate a transformation of cities towards such recovery, the involvement of their citizens will be beneficial, facilitated by types of learning that TE can contribute to (section 3.2).

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3.1 Towards Resilient Cities: Priority Issues

Resilient cities are cities that have the ability to absorb, recover and prepare for future shocks (economic, environmental, social & institutional). Resilient cities are closely related to ecological resilience, sustainable development and well-being (Pickett et al., 2013). In this section, we focus on two main issues that have illustrated vulnerabilities exacerbated by Covid: food security and social cohesion (through inclusiveness and circular economy principles). They are not the only ones but are key and, more importantly in the context of this article, they have started being tackled through education, and TE, in particular.

The Council of Europe (2021), in its preparation of a "Manifesto for a new urbanity", identified some of the priorities which the pandemic has highlighted, including: striking a new balance between urban and rural areas; the roll-out of a real digital revolution in local democracy; the swift development of smart, green cities, and the reduction of inequalities and the digital divide.

The debates also advocated the establishment of more effective multi-level governance systems that would be genuinely capable of upholding the principle of solidarity. Adding to this, the European Parliament (2021) explored challenges for urban areas in the post-COVID-19 era, calling for the prioritization of circular economy frameworks, investments in renewable energy, sustainable and affordable urban and suburban mobility, alternative transport infrastructure, proper maintenance of existing infrastructure and rapid investment in green infrastructure, parks, outdoor green and recreational facilities. It also pointed to the fact that the pandemic had accelerated digitization, affecting nearly all aspects of our lives, and stressed the need to ensure inclusion and access to new digital tools.

The FAO which, in 2002, had already worked on food insecurity (that it had defined as a socio-economic situation that leads to limited or uncertain access to the nutritious food necessary to maintain a healthy and active life), recently stressed that the pandemic has disrupted urban food systems worldwide. This "has presented a number of challenges for cities and local governments that are obliged to deal with rapid changes in food availability, accessibility and affordability—which strongly impact the food security and nutrition of urban populations" (FAO, 2020, p. 5). The UN (2022) confirmed this conclusion, opening its "Commission for Social Development" with a strong call for overcoming food insecurity, a major source of growing poverty, and promoting new sustainable food systems (https://www.un.org/press/en/2022/soc4898.doc.htm). IPES Food also stressed that the food security crisis "has underlined that food is not a commodity like any other and that the paradigm shift long demanded by many in *food systems*—from social movements and indigenous peoples to small-scale producers—is now more urgent than ever" (2020, p. 6).

As the FAO (2020) has shown, a number of initiatives have already been undertaken to address the food crisis (food aid systems in Milan; coordination of efforts with rural producers in Medellin; decentralization of food shopping in Lima, etc.). IPES (2020, p. 6) also pointed to "a remarkable upsurge of solidarity and grassroots activism (…) and the fact that the crisis has offered a glimpse of what new and more resilient food systems might look like", providing examples of actions undertaken

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in India, Kerala (free community kitchens run by women's networks), Portugal (where temporary citizenship rights have been granted to migrant workers), British Columbia (where community gardens and farmers' markets have been declared "essential services"), or Thailand (where comprehensive actions, including seed distribution and the strengthening of online sales, are being taken).

However, a lot remains to be done, including a change in governance processes and the need to facilitate the exchange of experiences and to raise the voice of local governments in the global arena. The FAO (2020, p. 5) suggested the establishment of an *Urban Food Actions (UFA) COVID-19 Knowledge Hub* to facilitate not only local governments" access to reliable information on practices by national peers but also by peers around the globe. It also emphasized that international city networks such as the Milan Urban Food Policy Pact (MUFPP) can play a crucial role in fostering dialogues.

In an interview, Olivier De Schutter, special adviser to the UN on issues related to the right to food from 2008 to 2014, explained that "a new history of agriculture needs to be written that will focus on the *re-localization of food* production systems. Policies need to create closer links between producers and consumers and to encourage more diversified products at the regional scale to increase regional autonomy and resilience" (in Dion, 2015, p. 45).

Simon (2021) examined how practical TE, through Urban Agriculture (UA) and experiential learning focused on how to produce food differently and with different stakeholders involved, could help urban communities to build more resilience through strengthening food security. Through a networked set of UA initiatives, improving the interconnections between agricultural and non-agricultural activities so that principles of a circular economy are put into place at the city scale, with wastes from one production unit being used as an input in another production process, could also help to make a city more sustainable. For instance, organic wastes from UA units and households could be used to generate organic compost. In a circular economy where "closing the loop" (reducing waste) is considered as a sustainable outcome, the territory matters (Ellen MacArthur Foundation, 2020): it is thanks to the interconnection between existing stakeholders, and the creation of new start-ups that will help in using certain wastes better, that the loop can be closed. This can only be done if the stakeholders are keen to cooperate and appreciate that, in addition to producing food, the urban agricultural system can offer a wide range of ecological functions such as biodiversity, nutrient cycling, and climate regulation, and cultural functions such as recreation, cultural heritage, and visual quality (Oliveira & Morgado, 2016).

The creation of different types of connection between stakeholders in post-Covid urban environments will also demand new ways of thinking since social distancing and confinements created new ways of thinking and communicating. In its Special Issue (May 2020) on "Changing our cities after the pandemic", the newspaper *Courrier International* documented a collection of experiences, from the proliferation of solidarity networks, showing a complete change in human relationships within cities, via stronger reliance on local authorities, the development of cycle paths to facilitate citizens' safe movement in big cities such as Milan and Paris, to a return to the creation of urban farms, established for instance on roofs and car parks in Singapour (a country which used to import 90% of its food).

Work is now focused on re-designing the cities of tomorrow and envisaging and imagining the long-term changes that Covid-19 will have triggered. In Europe, the *New Urban Agenda* represents a shared vision for a better and more sustainable future. As the document stresses, if well-planned and well-managed, urbanization can be a powerful tool for sustainable development and can have a real transformative power.

3.2 Skills for Sustainability Promoted by TE

The skills that are going to be needed to initiate cities' transformation for a post-Covid recovery can partly be provided through TE approaches—although, as Part 3 concludes, some potentials of TE still need to be explored. The city-scale is interesting because, as Estrela and Smaniatto emphasize, "as a learning space and content, [it] offers multiple sources of territorial knowledge, which can contribute to create more inclusive and responsive urban environments" (2017, p. 27). In this section we explore how this relates, in particular, to UA, landscape architecture, participatory governance and ICTs.

3.2.1 Experiential, Project-Based Learning: UA and Landscape Architecture

In order to grasp the practical dimensions of a sustainable city, one has to embrace practical projects and acquire practical skills. As Kolb explained (1984), learners need experiential components to understand concepts in depth. Many researchers have highlighted the importance of focusing on practical issues from a systems perspective in order to appreciate the multiple dimensions (economic, social, political and environmental) of "sustainability" and what a "sustainable city" could be.

Thus, in UA educational projects, *systemic learning* is fundamental because agriculture is seen as a human-natural system. Adopting a systems approach (Bawden, 1991) brings a logical combination of theory and application and focuses on key competences (Bawden, 2007). In the trans-disciplinary agro-ecology educational projects presented by Francis et al. (2011), people felt that work on sustainable farming and food systems created an effective learning landscapes "for students to deal with complexity and uncertainty and a wide range of biological and social dimensions, life-cycle analysis and consideration of long-term impacts" (Francis et al., 2011, p. 226). In the various courses described by Francis et al. (2011) in agro-ecology (broadly defined as the ecology of food systems) and perma-culture (the art of cultivating crops permanently), students are involved in the development of new systems of governance and new management regimes aimed at managing better the interconnections between agriculture and overarching resource systems of food, energy, water and land-use. A whole set of skills are required to enable students to improve these systems of governance (such as negotiating, open-mindedness, appreciation of different perspectives). Work projects are focused on local contexts and stakeholders and students are put in real life situations within which they have to reflect in view of developing sustainable agriculture solutions for the community.

In Landscape Architecture, experiential learning and "placed-based education" have also been advocated. At the university of Oregon, for instance, Keeler (2011) explored the real and theoretical characteristics of place-based education, as an alternative to conventional hierarchal teaching and concluded that *place-based experiential education* is characterized by the following attributes: (1) it

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emerges from the particular attributes of a place and is specific to geography, ecology, sociology, politics, and other dynamics of that place; (2) it is inherently multidisciplinary; (3) it is inherently experiential and includes a participatory action or service-learning component geared toward ecological and cultural sustainability; (4) it is reflective of an educational philosophy that is broader than "learn to earn" and (5) it connects place with self and community and includes multi-generational and multicultural dimensions as they interface with community resources (2011, p. 14).

3.2.2 Social Learning through TE and Participatory Urban Governance

In order to facilitate a multi-stakeholder involvement towards making cities more sustainable, would it be possible to create social learning platforms that would consider urban citizens as active participants in the co-creation of urban space and therefore in urban governance? For this platform to work, the various types of stakeholders involved would have to learn negotiation, listening and cooperative skills. In parallel, educational programs would benefit from integrating cities' challenges and strategies since, as Jabareen (2012) observed, themes that are related to urban and community planning are commonly neglected in sustainability education.

Enhancing TE and the "co-creation of places" amongst very different urban citizens will require a rich understanding of how people live, encounter others and move around, and of how people use public spaces, as well as what their needs and preferences are (Estrela & Smaniotto, 2019, p. 29). Through the construction of learning networks, TE could facilitate the participation and social learning of not only students but also citizens who have something to share in their understanding of-and expectations from-the urban public living space. Some would argue that such learning and exchange online networks could also, in the spirit of "global citizenships", extend to international networks.

On its "Education for Sustainable Cities" web page (1), UNESCO, although it clarifies its goals, doesn't give much practical guidance on how to facilitate social learning in an urban context. The learning skills developed by one—exceptional-educational project caught our attention: it incorporated the concept of city sustainability and was experimented on with university students in the Jakarta Metropolitan Area, Indonesia by Kinoshita et al. (2019). It fostered five key competencies in sustainability: systems-thinking, anticipatory, normative, strategic and interpersonal competencies. The learning experiment was based on a fictional narrative describing sustainability issues in Jabodetabek, in which the protagonist was the head of the local urban planning bureau. The teaching program worked on the premise that "city sustainability" denotes the maximization of the total economic and social net benefits that a city produces, without exceeding any environmental limits and while staying within acceptable limits of socio-economic inequity (Mori & Yamashita, 2015). Materials were developed in the *Case Method* style-an approach in which a teacher and students proceed through a course collaboratively around a "case", a story that is provided from the view point of a protagonist. Students are required to address the problems that the protagonist faces. The method used focused on hypothetical scenarios regarding land-use patterns which addressed the high uncertainty in Jakarta's future development and the respective impacts of various courses of action to increase students'

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"anticipatory competence" (Albert et al., 2015). The *Case Method* was expected to bolster the normative and strategic competencies of the students by tackling conflict resolution and the building of trade-offs, whilst the *workshop approach* improved the interpersonal competency through encouraging communication among participants from different backgrounds (Brundiers et al., 2020).

3.2.3 Sustainability Skill and Information and Communication Technologies

Experiencing various confinements during the pandemic period transformed learning processes and, consequently, also influenced how one might envisage new ways of teaching and learning about sustainability. As Burbules et al. (2020) explain, IT, in particular, is a driving force for educational reform, as well as a means of promoting shared knowledge in society (p. 94). The skills and learning outcomes advocated to help to operationalize sustainability, together with the transversal competencies needed for the "jobs of the future" (Care, 2017), can be brought about by the information age, with schools becoming sites of critical collaborative inquiry and autonomous constructivist learning, and students working with new technologies to solve authentic problems under the guidance of a facilitative teacher (Lemke, 1998). New learning methods using digital media could "help students examine and reflect upon their professional responsibilities, capabilities, and personal motivations" (Mulà et al., 2017). Skills such as "the big 4Cs"—Critical thinking, Creativity, Communication, and Collaboration-rest upon a different conception of preparation for life and work—i.e., flexible capabilities related to learning to learn and adapt to changing demands, rather than specific subject-matter knowledge and different types of interactions using new digital media (Burbules et al., 2000).

With a major change in educational aims and objectives, therefore also come changes in learning and teaching processes (e.g., varying degrees of customization), which can facilitate a shift from *curriculum-based* to *problem-based learning*, as well as shifts from a more passive, recipient model to a more active, self-directed, co-constructionist model (Burbules, 2014). The context and the scale both matter in these learning processes, closer to TE, although facilitated by ICTs.

New technological developments in society also allow us to think of changes in the spaces and contexts of learning. A potential in such changes involves increased use of visualization and virtualization technologies which enable the creation of a sensory learning environment (Burbules, 2009). "The learning environment is extended both spatially and temporally. Ubiquitous learning opportunities can be made available. Learning can become more contextual, immersed in real life situations, problems or questions, which suggests in turn different reasons for learning and a more organic relationship of learning to other needs and interests" (Burbules, 2020, p. 95).

In all initiatives on new educational paths for sustainability, research has demonstrated that sustainability oriented-programs could not be successful unless people directly concerned by them were also involved in their design and running (Healy et al., 2013). This implies an appropriate size of activities, at a manageable scale. Later in this paper, we will see that the local surrounding of communities, especially in the context of urban agriculture and circular economy (Ellen Macarthur

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Foundation, 2020), relates to a visible territory within which the community's "carrying capacity" (p. 2) (Rees & Wackernagel, 1996) can be envisaged as "appropriate" for various reasons. TE can focus on learning objectives at this scale, and include not only the know-how relative to the efficient and environmentally-friendly production processes but also the skills needed to build resilient and sustainable communities. The lessons derived from the Canadian Community Economic Development (CED) Network adds that in order for educational changes to be successful in helping to operationalize sustainability, solutions must be rooted in local knowledge and led by community members using holistic and integrated approaches. Traditional CED partners include local entrepreneurs, business owners, researchers, and public policy makers working together to support individuals, to build enterprise, and to strengthen communities. Using ICTS can enlarge and consolidate such networks and partnerships. Broadening current CED partnerships to include local school systems is an essential step. This approach is being pursued through a series of workshops organized by UNESCO and called "The transformative power of education for sustainable development for the world beyond Covid-19" (https://en.unesco.org/themes/education-sustainable-development/ESDfor2030-workshops).

4. Areas for Future Research in TE

4.1 Opening Learning Processes—Linking TE and Citizen Science to Strengthen Urban Food Security?

For educational systems to become more focused on the territory they are located in, student-centered and case studies rooted in the territory will be needed, as well as more participatory modes of learning processes. The area of urban food security was mentioned earlier in this article, as a priority area in the recovery of cities and their transformation towards becoming more sustainable and resilient. If learning is also to be more participatory, we feel that investigating ways to consolidate links between Citizen Science and TE focused on UA could be a promising contribution to Education for Sustainability in a period of post-Covid recovery.

Citizen Science (CS) appeared as a field of research and practice in the 1990s, and refers to the active engagement of the general public in scientific research tasks. It emerged from a variety of participatory approaches (action research, systems thinking and practice workshops, surveys and questionnaires, participatory GIS, etc.) that had already been developed, illustrating a strong need to not only democratize decision-making processes and involving people in projects but also to improve the quality of data gathered when making policies that lead to societal changes (Vohland et al., 2021)

In urban agriculture, for instance, about a third of the Lisbon UA projects focus on mandatory training—e.g., on organic production or composting -, education or capacity building programs (Abreu, 2012) and practically all the UA initiatives include educational activities in parallel with food production (Delgado, 2017). The way in which the learning is enhanced is both conceptual but, more importantly, experiential (e.g., pedagogical allotments', where the public can visit and learn farming techniques or even farm their own plot, as showed by Cancela (2009)), helping learners to develop practical skills. TE could also, through UA case studies, contribute to animating debates on health, diet

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and immunity—much needed in a pandemic context. The objective would be to investigate to what extent UA initiatives could focus on varied and well-targeted crops that would contribute to improving not only the city biodiversity and food security but also citizens' health and diet (Saavedra et al., 2017). Exploring how Citizen Science could contribute to these initiatives would allow to better capture learning processes and knowledge. This was done in Australia, where experiments in UA got more systematically integrated into an educational and research process focused on research in Citizen Science (Pollard et al., 2017). The objective was to develop a project ("The Edible Gardens") to investigate the inputs (labor, costs and water use), and outputs (produce yields and value) of urban food gardens. This type of approach is in line with projects that investigate the potentials of Citizen Science in agriculture (van de Gevel et al., 2020) and others that examine how learning processes emerge or evolve from research activities that involve citizens' participation (Kloetzer et al., 2021). Recognizing the value of local, territorial knowledge (as TE does) is, indeed, different from who provides this knowledge, in which way and by what means, and for which reason (areas of research that Citizen Science is more focused on). If UA projects are to help in addressing food security issues in cities, investigating how they could be better integrated into learning processes (in formal and informal education), with different types of participants, could be done by exploring links between TE and CS.

From a territorial capacity perspective, what is being collectively learnt to make the city more sustainable emerges not from a set of knowledge divided into disciplines and previously defined, but from "a set of knowledge constructed through the *elaboration of a narrative* that is simultaneously an identity one" (Estrela & Smaniotto, 2019, p. 30). This narrative, in the context of our fight against the pandemic together with our will to make cities resilient and sustainable, need to be constructed carefully and collectively. Simon et al (2022) initiated a reflection on the potentials of Citizen Science in the context of socio-spatial studies, an area of research that needs to develop further in the near future.

4.2 ICT Platforms to Facilitate and Monitor Circular Economy Networks and Processes

We highlighted, in previous sections, the importance of networks in facilitating the sharing of knowledge between various types of stakeholders and at different levels.

For Castells (1996), the concept of network society characterizes the social structure emerging in the information age, gradually replacing the society of the industrial age. One important characteristic of networks is that they facilitate social learning outside educational institutions. In the context of "education for sustainability", this is of crucial importance. Different types of knowledge can be exchanged amongst alternative types of "experts". As many authors noticed, the curriculum for global citizenship and sustainability has to be both formal and informal and certainly not a straightforward top-down process but more of a dialogical process of joint-meaning construction (Johnson & Morris, 2010; Veugelers, 2011). It requires exchanges between various types of stakeholders, away from exclusive scientific expertise. "The challenge faced is that of converting [learning platforms] into cosmopolitan centers capable of building bridges between different cultures and types of knowledge in

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a process of epistemological decolonization" (Teodoro, 2020, p. 94).

In the context of urban centers, using ICTs will help not only in consolidating networks and social learning but also, and this is crucial for TE, in constructing "mediated places". Recently, the CyberParks (2) research project (2014-2018) highlighted the need for a conceptual framework for the production of such "digitally mediated public space", that it defined as "space where nature, society, and cyber-technologies blend together to generate hybrid experiences, opening new possibilities of use and enhancing quality of urban life" (Smaniotto Costa & Erjavec, 2019, p. 4). The Cyberparks project showed that engaging people provoke real and sustainable changes in quality of life and in the urban environment (GreenKeys project, 2008) and that technology is enabling new forms of space appropriation and attachment. As Smaniotto Costa and Erjavec (2019) explain, further studies could include investigation via self-reporting measures that involve subjects as social justice, co-creation and social reporting. Self reporting and sharing data through Citizen Science methods could also considerably help with facilitating circular economy processes, whereby the waste of one production unit can be used as an input by another. Sharing information on the availability of such resources could stimulate innovation and consolidate links between entrepreneurs in view of gaining a better overall understanding of production loops and of what a circular economy would look like at a city level.

5. Conclusion

The general turmoil created by the current pandemic has encouraged us to look at what organizing our societies and economies in more sustainable ways could mean. Despite numerous debates on this, since the 1970s, understanding *what needs to be learnt* about "sustainability", and *how it could be put into practice*, still needs improving. What is for sure is that, despite shared preoccupations (pollution, loss of biodiversity, more extreme weather events, etc.) at the planetary level, it is at the local level that practical solutions are often found and "knowledge about sustainability" really emerges. As Ison et al. (2007) suggested, "sustainability science" [now] needs to create new understanding by close coupling of multiple knowledge systems into "learning systems" based on social networks. A sense of global citizenship is crucial, but local contexts-culturally, geographically, historically-also matter.

Territorial Education has naturally emerged out of the progressive changes that occurred between environmental education, education for sustainable development, development education and education for sustainability. Place and context-based, its *raison d'être* is first of all practical—i.e. to respond to real-life imperatives in order to operationalize sustainability in a way that is meaningful to people who will both learn about it and make it happen. This means that TE both puts a strong emphasis on experiential learning but also on social learning (learning together, within networks that value diversity). This approach emphasizes real-world learning experiences that complement academic achievement, helps learners to develop stronger ties to their community, enhances their appreciation for the natural world and creates a heightened commitment to serving as active, contributing citizens (Sobel, 2004).

This article focused on TE in the city and identified food security and social cohesion and participatory

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governance as relevant points of focus for its post-pandemic recovery. Work initiated on urban agriculture in various parts of the world, as well as the general spread of ICTs in all aspects of our lives would gain from being analyzed and improved through a "territorial education" angle, with the objective to facilitate the transformation of urban environments into more sustainable ones. In view of both pursuing research in TE and showing its practical, policy-oriented utility, it will benefit from being more closely linked to research in Citizen Science, as well as urban governance for circular economy processes in cities, in view of both contributing and learning from the territory and helping to improve the understanding of what a "sustainable city" and by whom it is transformed.

Acknowledgement

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Note(s)

Note 1. https://en.unesco.org/unesco-for-sustainable-cities/education-for-sustainable-cities

Note 2. The ecological footprint is defined as the impact of a person or community on the environment, expressed as the amount of land required to sustain their use of natural resources.

Note 3. http://www.cyberparks-project.eu. Funded by the H2020 European Programme "Cooperation in Science and Technology" (COST), CyberParks explored in terms of policy-making, urban planning and design, the numerous challenges and opportunities created by digital and mobile technologies.