The Pedagogical Pentagon of Parks: A Conceptual Framework for the Educational Analysis of Urban Green Spaces as Emerging Places for Learning

El pentágono pedagógico de los parques: Dispositivo conceptual para el análisis educativo de los espacios verdes urbanos como sitios emergentes de aprendizaje

Liliana Valladares Riveroll[a] iD ✉

[a] Universidad Nacional Autónoma de México. Facultad de Filosofía y Letras. Av. Universidad 3000, 04510, Ciudad de México, México.

ABSTRACT

This article proposes a conceptual device for the techno-pedagogical analysis of urban green spaces. It explores how urban parks are integrated into the networks of educational and learning practices that occur in the public space and if it is possible to organize them as pedagogical strategies. The Pedagogical Pentagon of Parks (PPP) is proposed as a conceptual, analytical lens to ensure that urban parks and everything happening and present in them communicate educationally. The PPP is a framework of five articulated categories (public pedagogy, learning cities, smart learning, cyberparks, and museographic language) that transform our view towards the parks to intervene in them as emerging learning territories.

RESUMEN

En este artículo de revisión se propone un dispositivo conceptual para el análisis tecnopedagógico de los espacios verdes urbanos. Se cuestiona de qué manera los parques urbanos se integran a las redes de prácticas educativas y de aprendizaje que ocurren en el espacio público y si es posible organizarlos como estrategia pedagógica. Se propone el pentágono pedagógico de los parques (PPP) como lente conceptual y analítico para lograr que los parques urbanos, y todo lo que en ellos sucede y está presente, comuniquen educativamente. El PPP es un entramado de cinco categorías (pedagogía pública, ciudades del aprendizaje, aprendizaje inteligente, ciberparques y lenguaje museográfico) que en su articulación transforman la mirada hacia los parques para intervenir en ellos como territorios emergentes de aprendizaje.

Introduction: Parks as emerging places for learning

On January 30th, 2020, COVID-19 was declared a global pandemic and public health emergency scenario by the World's Health Organization. Due to its fast spread, social distancing was the principal prevention measure, and stores and schools among other places were closed. UNESCO estimates that almost 1,600 million of students (70% of world enrollment) were affected by the closing of education centers in 192 countries during April 2020 (Martínez & Díez, 2020).

With school closed, formal education models and spaces were destabilized and new educational alternative -both formal and informal- thrived involving cities and urban ecologies as infrastructures for learning and out-of-school activities (Rousell & Ka-lai, 2021; Jucker & Von Au, 2022; Schmelkes, 2022). In many urban or semi-urban contexts, the educational process could continue thanks to the networks and social organizations which over time had generated educational spaces, allowing people to improve their knowledge and abilities via upskilling or reskilling processes. Acknowledging this educational, extracurricular network generally nurtured by the differentiated use of the public space has contributed to the fact that cities -under the term *learning cities*- could be seen as continuous learning networks in which the traditional boundaries of formal education institutions and cities dissolve, as well as the limits between formal, non-formal, and informal education (Charman & Dixon, 2021; Rousell & Ka-lai, 2021). In March 2023, the UNESCO Global Network of Learning Cities was formed by 294 cities from 76 countries, 10 of them in Latin America (UNESCO, 2023).

The need of working in open spaces to avoid contagion emphasized the benefits of learning in the open air, in the city, over the city, using it (Molina et al., 2022),

and proving that it was possible to manage and change an urban dynamic which was previously seen as fixed, so that the city also *learns*. Barriers of educational spaces were pushed forward, outside the school, giving way to a rewilding or reconnection between people and the environment thus "acknowledging that humans are not our only teachers" (Powell & McGuigan, 2022, p. 7). Informal learning infrastructures continually seek the attention of citizens therefore strengthening the pedagogical power of the public spaces: "From graffiti to advertising, rail networks, zines, squats, and block parties are now seen to have the potential to 'teach'." (Burdick et al., in Rousell & Ka-lai, 2021, p. 6).

As discussed by Facer and Buchczyk (2019a and 2019b), new educational and learning practices are no longer limited to the school space, but they also take place in the public space. Learning may be seen as the effect of social relationships networks and articulated moments in these contexts shaping the material, the human and non-human, interconnecting people, materials, objects, resources, institutions, and diverse spaces flows in which the city and multiple areas, such parks and green spaces are not only context but connecting parts.

This article suggests a conceptual framework for the techno-pedagogical analysis of green urban spaces. Derived from the notion of educational devices described by Yurén and Mick (2013), the *conceptual framework* is understood here as the group of theoretical elements arranged and ordered in a logical manner so that they explain and articulate a framework of meaning to analyze the educational dimension of parks. It is determined how parks are integrated into educational and learning practice networks developed in public spaces, and if these open-air scenarios can be organized as a pedagogical strategy to foster knowledge, skills, and values. By *green urban space* we refer to the series of

"zonas localizadas en el interior de la mancha urbana —puede ser un jardín, parque o un espacio verde lineal— que presenta una delimitación, administración y reglamento determinados, y es producto de una intervención humana que lo ha transformado en un sitio funcional donde se realizan actividades sociales, recreativas, deportivas o de convivencia. Además, está cubierto por vegetación, posee un área de suelo permeable de al menos 30 % de su superficie total y es parte de la historia urbana y del patrimonio de la ciudad…" (Larrucea & Reyes, 2020, p. 16)

[spaces located within the urban area —a garden, park, or linear green space— with specific delimitation, administration, and regulation, and it is the product of a human intervention which has transformed it into a functional place where social, leisure, sport, or community activities take place. Besides, these spaces are covered by vegetation, contain at least 30% of permeable soil, and they are part of the city's urban history and heritage…].

According to their specific features, Layuno (2007) classifies them in natural parks (representative units of wild or humanized nature) and historical parks (conveyors of ancient human or historical ruins habitats). In both cases, regardless of the level of human intervention, this manuscript describes how these spaces represent places of potential learning and reconnect formal education with both informal and non-formal spheres. Likewise, some intentional contextualization and interpretation processes with didactic purposes are posed, with the aim of contributing to both citizen and heritage education, capitalizing their pedagogical value.

In order to visibilize the pedagogical relevance of these spaces, and in general, any public space, it is proposed a framework of five categories shaping a conceptual lens to understand and analyze the educational role of parks. In order to create this framework, a documentary research was conducted in three databases (JSTOR, Springer, and Taylor and Francis), with the aim of identifying, selecting, and assessing all the publications potentially containing conceptual categories associated to the analysis of the pedagogical dimension of urban parks. Some of the terms used to conduct this search were *urban parks*, *parks and education*, *outdoor education*, *cities and education*, *public pedagogy and parks*, and *informal learning and parks*. The questions which allowed to select and assess the relevance of the reviewed literature were the following: 1. How has been approached, both theoretically and methodologically, the pedagogical dimension of parks? 2. Which learning models have been developed for these spaces? and 3. How to adapt a pedagogical design for these spaces?

Starting from a documentary analysis, it was possible to identify and filter a group of five key concepts that helped to clarify some of these questions. Through an interpretative and categorizing process with these terms, a framework of meaning was generated. A conceptual lens that may facilitate the comprehension of the educational role of these spaces and help to visibilize the possibilities for pedagogical intervention they offer. This pedagogical pentagon of parks (PPP), resulting from the documentary research is shaped by the concepts of public pedagogy — emerging research field focused on the learning in public spaces— and smart, educational cities for learning envisioned by the UNESCO and the Organization for Economic Co-operation and Development (OECD). To this network are added the concept of smart learning, and the pedagogical models of cyberparks by Klichowski et al. (2015) and Bonanno et al. (2019), and the proposal of open spaces museumization and landmark interpretation as the necessary vehicle to develop the necessary museographic, didactic language required for these spaces to *tell stories and educate people*. In the quest to ensure that parks and what occurs in them operate together and communicate educationally, it is implied that the PPP is a conceptual framework offering a meaningful approach to transform the way urban parks are conceived into emerging places for learning, which additionally prove to be strategic for a post-pandemic recovery. This conceptual framework, while visibilizing the pedagogical relevance of these urban spaces, offers at a methodological level, the necessary tools for its techno-pedagogical analysis.

Parks telling a story: The absence of a pedagogical approach

As pointed out by Klichowski et al. (2015), generally parks are considered as places for leisure, recreation, and relax in which people used to go to read the newspaper, but in which more and more people are seen connected to their cell phones and tablets. Though apparently neutral, parks are also spaces for public pedagogy and politics, and many times architecturally designed and built with an educational intention (Larrucea & San Martín, 2022), so they could be considered as social technologies which help to build and rewrite social practices and behavior patterns.

The study conducted by Mukerji (2012) on the Gardens of Versailles in 17th century France shows how these spaces may exert pedagogical power with political effects. The author explains that these gardens were used to equate France and Rome and present the first as the true heir of its imperial destiny. By combining art, architecture, and classic-inspired engineer, visitors were invited to interact with artifacts, games, and rituals, and thus experience the Roman heritage of France, exploring the new *worlds of imagination* (Mukerji, 2012, p. 516) of the French Empire, promoting political identities and principles, as well as social relationships favorable to the king.

Martínez et al. (2020) also highlight parks as ideological products and instruments of political power, which, far from being lifeless and neutral spaces, they set processes, interactions, and meanings connected to the historical, socio-spatial, economic context of the cities. These authors also illustrate some of the historical reshaping of Mexican parks from the 16th to the 20th centuries.

According to Popović et al. (2020), public spaces are the new natural places for learning: just *being there* has a political, collective, educational relevance. Parks are created by the interactions of visitors with the space and the social relationships happening there. Public life occurs in them, and social actors recognize each other, get visibility, and formally or informally agree on the uses and manners of appropriation -both material and symbolic- of the space, to build a sense of identity and belonging (Guadarrama & Pichardo, 2021). The public space is a multiplicity of spaces which generate and recreate, meeting different dynamic functions over time (Guadarrama & Pichardo, 2021).

Due to their rich biodiversity and state protection, national parks mainly function as sites for recreation and edification (Carrero et al., 2011). Parks offer numerous benefits at a psychological, cognitive, physiological, social, and spiritual level, with effects in both physical and mental health, individuals' identity and autonomy, connection, and sense of belonging, learning and abilities (Jiménez, 2020). Apart from their recreational, spiritual, cultural, historical, therapeutic, aesthetic, sustainable, scientific, ethical, and economical value, their pedagogical value must also be recognized (Muñoz & Olmos, 2010; Carrero et al., 2011; Smaniotto & Šuklje, 2019). This is the conclusion, for example, of the study by Carrero et al. (2011) with 115 teachers from ten primary schools in Venezuela: while around 33% of the interviewees acknowledged the sustainable, scenic, recreational value of parks, only 6% considered their educational value.

This lack of appreciation of the educational potential of parks has its effect in their planning, preservation, and management, which make them fertile grounds for continuous learning. According to Muñoz and Olmos (2010), the educational value of these spaces is generated not only through the educational activities developed in each park, but by the core elements fostering primary processes of education such as identity, affection, relationships, sense of belonging, and the communicative competence between parks and individuals.

A revealing category of the contribution of these spaces to both physical and mental health, as well as the acquisition of cultural benefits, is that of the "cultural ecosystem services". In words of De Montes and Forero (2021, pp. 2-3), these services are "beneficios no materiales que las personas obtienen de los ecosistemas a través de experiencias cognitivas, espirituales, recreativas y estéticas" [non-material benefits that people obtain from ecosystems through cognitive, spiritual, recreational, and aesthetic experiences]. These cultural services go together with other ecosystemic services (of regulation, support, provision), which are generally considered as resultant of the physical, chemical, and biological interactions within the ecosystems, and allow access to environmental goods and services essential to life (water, earth, pollination, wood, shade, biogeochemical cycles, pest control, and others). The analysis of these cultural ecosystemic services is acknowledged as scarce, but relevant for the quality of life of people and communities and to promote the importance of local knowledge.

Larrucea and Reyes (2020) agree in considering green public spaces as places of social integration and interaction which should be analyzed both qualitative and quantitatively, as they are areas of environmental, cultural, and heritage value. These authors have gathered methodological proposals to assess urban parks under cultural, social, and environmental approaches, which represents a step forward to evaluate them in pedagogical terms. Parks are spaces undergoing continuous remodeling, but many of the times these processes are not part of an integral design plan which takes into account the location and planning of citizen and heritage activities and experiences (Larrucea & Reyes, 2020).

Parks host myriad elements and micro ambiances of educational interest, generally without any type of mediation (verbal, textual, or technological) which fosters educational experiences (Packer & Ballantyne, 2016) or learnings among visitors (Serrat, 2007). To this challenge, it should be added the absence of a techno-pedagogical design project that leverages their educational value (Coll et al., 2008). Likewise, little is known on the practices and educational services being developed in several parks, so it becomes necessary to identify and systematize them in order to improve them and articulate them as comprehensive, educational projects capable of providing identity to each green urban space (Cortés & Rodríguez, 2009). The design of this type of spaces is rarely penetrated by didactic criteria or principles which, by means of a script or narrative intentionally structured and interactive, allows to "transmit an idea" and communicate a message to a wide audience according to a set of educational objectives (Santacana, 2007; Roppola, 2012). Even less reduced is the possibility for this design to be engaging and able to meet the requirements or recover the interests of the citizens (Jennings et al., 2019). This leads to considering parks as spaces lacking significance for the urban life, not having links with the learning and cognitive dimensions, which results in their devaluation and degradation, or their conception as spaces exclusively for leisure and relaxation.

For example, the study by Montes and Forero (2021) found out that 19% of park visitors in Colombia perceived tranquility as the service with which these spaces contribute to well-being, in contrast with the service of environmental education, perceived as such by 2% visitors. This study also clarifies, however, how this perception varies according to the socioeconomic characteristics.

Those visitors considered having lower income and educational levels mostly perceived benefits such as tranquility or hiking, while visitors with higher incomes and technical or university education focused mainly on benefits associated with the aesthetics, knowledge, or environmental education. In contrast to these data, 42% of the visitors of this park indicated as the main reason for visiting it their interest in "learning about nature" (Montes & Forero, 2021, p. 11).

Given the increasing relevance of environmental education in a context of climate emergency as the one we are all living in, united to the experienced lived by students during the pandemic, would be it possible to change such a reduced way to look at urban parks? Would be it possible to identify, design, and reinforce their educational function? and, what would be needed to do so? The following section discusses the PPP as a conceptual lens which facilitates the processes of diagnosis and techno-pedagogical intervention in urban parks to maximize their educational potential. It should be clarified that *techno-pedagogical* refers to the type of intervention which includes both the planning of an educational process as well as the incorporation of technological tools to be used in the development of said proposal teaching and learning contents, objectives, and activities (Coll et al., 2008).

The pedagogical pentagon of parks: Conceptual Lens to maximize the role of education of green urban spaces

On the question on how to design and maximize the educational potential of parks, the present article proposes —as the main result of a documentary analysis— five conceptual categories which, articulated, facilitate the study and comprehension of these spaces as places for continuous education within smart cities and learning environments.

As shown in Figure 1, the PPP introduced in this section consist of a theoretical framework which links concepts in which connections the relevance of the public pedagogy is evident as an emerging field on educational research to conduct studies on the diagnose and techno-pedagogical design of urban parks, in order to leverage their pedagogical value.
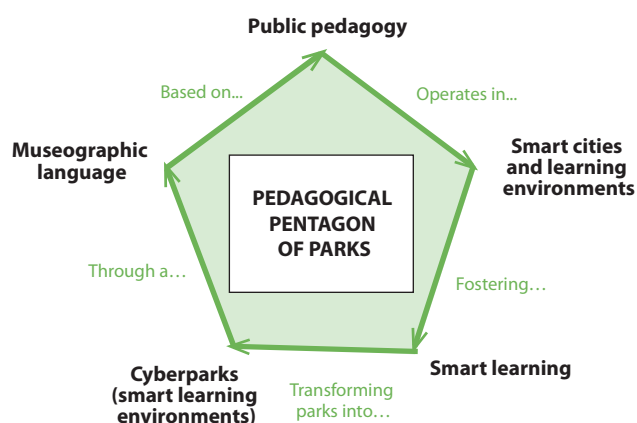

Fig. 1. Pedagogical pentagon of parks.

Source: Authors' elaboration (2023).

Public pedagogy

The term *public pedagogy* appears in 1894, was developed until 1960, and expanded in 1990 to refer to an educational research field analyzing the forms and the process related to education and learning outside the schools, taking place in extra institutional spaces (Sandlin et al., 2011) such as Parks, museums, botanical gardens, but also popular culture, the internet, social movements, and activism, among others (Sandlin et al., 2011; Kitagawa, 2017; Charman and Dixon, 2021). Its focus in on the pedagogical processes and functions of the public sphere, the education of citizens in and outside schools; in popular culture and daily life, in formal institutions and public spaces, in the dominant discourses and social activism (Sandlin et al., 2011), and in the bond of culture and learning with social change (Sandlin et al., 2017).

Public pedagogy studies how different areas of public sphere in which culture is configured and disseminated operate thus exploring how media, culture, and society operate as educational forces (Biesta, 2012; Sandlin et al., 2017). Within those disruptive sites for learning some pedagogical mechanisms have arisen shaped as semiotic structures, narrative and rhetoric plots in temporal-spatial dynamics fostering psychic disjunctions and locations, desubjectifications, and disidentifications with pedagogical effects both at individual and collective level (Ellsworth, 2005; Biesta, 2012; Uttke, 2012; Burdick & Sandlin, 2013). In these mechanisms, educators, contents, and teaching methods are frequently hidden and imbued in the repetition of discourse and routine, and therefore they are dissociated from their impacts in learning, thus constituting the invisible pedagogies, according to authors such as Acaso (2018) or Pasillas (2021).

These invisible pedagogies form a heterogeneous assemblage of agents and resources organized by implicit, unclear criteria (Pasillas, 2021) in which the human and non-human didactics complement each other (Watkins, 2015 and 2017). Molina et al. (2022) use the concept urban pedagogy to refer to the study of non-formal and informal education in the social context, highlighting the value of the city as place, medium, and object of education. Besides analyzing how individuals and audiences learn through the cities, this pedagogy also researches on how cities themselves learn and pedagogically evolve through time (Rousell & Ka-lai, 2021).

Smart, educational cities of learning

The urban public pedagogy considers that both daily experiences and interaction with the environment are part of a continuous, spontaneous learning process in which the city is a learning scenario (learning in the city), educator agent (learning from the city), and learning object (learning about the city) (Molina et al., 2022). This triple role of educator is associated to the notion of *educational city* promoted since 1990 by the OCDE (Popović et al., 2020).

The educational city is an urban educative model which reformulates the city as a place of continuous learning to achieve a better economic performance and greater productivity and innovation. Not only school provides education, but rather shares this responsibility in

L. Valladares Riveroll / Andean Journal of Education 6(2) (2023) 000625

an educative network formed by the individual's home, the urban environment, and the educational center, the "three Cs" according to Morales & Mezquita, 2018 (*casa, calle, centro escolar*). As counterbalance to this economic approach by the OCDE, the UNESCO suggested in 2012 the concept of *learning cities*, referring to those focused on life-long learning, which includes people from all ages, educational levels and spheres, and learning acquired formally or through other forms: family, community, work, or ITC (Torres, 2019).

When the concept of learning city is endowed with a virtual and technological dimension, it is labeled as *smart city*. As explained by Klichowski et al. (2015), the label "smart" is indistinctively used to refer to something improved by technology or to a technological solution. However, there are at least two meanings for the concept "smart". The first of them is related to technology and the development of urban, innovative solutions and applications aimed at energy efficiency, smart transportation, and enabling technology. The second meaning focused on individuals as active, interconnected, autonomous learners who control their own learning resources. Smart cities will then be those offering learning experiences to citizens local and globally interconnected, who use smart technologies to learn by sharing, reworking, and co-building learning resources capable of addressing social challenges (Buchem & Pérez, 2013).

Smart learning

For Buchem and Pérez (2013), smart cities are environments integrating and leveraging different learning approaches (such as mobile and ubiquitous learning), communication technologies and resources in a discreet, proactive manner in people's daily life. This means that these urban spaces are smart learning environments. These cities shape complex ecosystems supported by technological structures which transform citizenship's commitment, participation, and learning becoming "open libraries" with a myriad of learning resources: buildings, monuments, squares…

The educational experience in these technology-enhanced cities generate the so-called *SMART education*, which acronym describes its core attributes: 1. *Self-directed*, as students are themselves promoters and managers of their own learning process; 2. *Motivated*, oriented to resolve in a creative way problems both individual and collective in nature; 3. *Adapted*, as flexible and customized to the individual's needs and expectations; 4. *Resourced-enriched*, to expand and promote collaborative learning; and 5. *Technology-embedded*, which facilitates learning anywhere, anytime (Klichowski et al., 2015).

Within smart education, learning has also the adjective "smart" (technology-enhanced), because it occurs in a *seamless* context, through a combination of places, time, technologies, and social environments (Gros, 2016). Seamless learning is expressed in the blurring of boundaries between "work/play, learning/entertainment, accessing/creating information, public/private, formal/informal" (Burbules, in Gros, 2016, p. 2). The ten defining characteristics of Smart learning are: 1. Location-aware; 2. Context-aware; 3. Socially-aware; 4. Interoperable; 5. Seamless connection; 6. Adaptable; 7. Ubiquitous;

8. Whole record; 9. Natural interaction; and 10. High engagement (Gros, 2016; Zhu et al., 2016).

Notwithstanding, when media and digital technology (Smartphones, tablets, Wi-Fi connections) align with open-air, public spaces (parks, gardens, squares, etc.), the environments for smart learning in cities can generated and multiplied, as it is the case of cyberparks (Muñoz & Olmos, 2010; Klichowski et al., 2015).

Cyberparks

Klichowski et al. (2015) suggests *cyberparks* as an innovative, educational solution to leverage the educational potential of parks. This strategy consists of endowing public spaces with digital tools under a specific techno-pedagogical design, so that they can be transformed into immersive and interactive learning spaces capable of expanding and maximizing people's social, communicative, and collaborative competences. Cyberparks may be defined as "emergent hybrid environments where people, spaces, technology and purpose create the movement and rhythm of the dance." (Bonanno et al., 2019, p. 304).

Thus, for example, the use of apps in smartphones connected to a web service facilitates a follow-up of individuals' circuits and allows them to obtain contextual information, access to varied educational resources, and learn in and about the park. Applications such as open badges, smart glasses, augmented reality, and mobile tagging are part of the resources that can be leveraged (Buchem & Pérez, 2013).

Klichowski et al. (2015) and Bonanno et al. (2019) suggest a pedagogical model useful to design and evaluate learning processes in cyberparks. According to these authors, learning in these contexts is different from learning in the classroom because the former is more closely associated with a connectivist epistemology focused on connections generated through digital technologies, which connect people to "a wider network of knowledge, experts and learning communities via their adaptive devices" (Bonanno et al., 2019, p. 295) when interacting with resources and domains according to their learning interests. Learning in cyberparks is not prescribed but rather generated through the student's self-managed interactions, based on technologies which facilitate immersion, interaction, and connection between learners and the park.

Integration of technology associated to the physical environment leads to a multi-context, multi-channel, and multi-objective learning (Buchem & Pérez, 2013) combining physical and virtual spaces and allowing the coexistence in the learning environment of the natural/cultural, local/global, and formal/informal. Urban elements become educational resources which interweave the digital, cultural, natural, and architectonic dimensions of the public space, transforming their perception and appropriation (Klichowski et al., 2015; Bonanno et al., 2019; Smaniotto & Šuklje, 2019).

Learning in cyberparks is distinguishable for being: 1. *Continuous* and *seamless*, as it occurs anytime, anywhere, in any device combining technology and social scenarios; 2. *Geolearning*, as it uses context-aware and position-based technologies to add interactive points and layers of digital information to physical spaces, interconnecting locations and scenarios, and facilitating the exchange of

information; 3. Collective or *crowd learning*, as it leverages the audience's knowledge, experience, and the power of masses; and 4. By using *Citizen enquiry*, blending inquiry-based learning with active citizenship to build creative knowledge with social value (Klichowski et al., 2015; Buchem & Pérez, 2013).

According to Bonanno et al. (2019), the educational experience in these spaces is built by cognitive processes and affective and conative interactions together with interindividual, interactive and online processes in which varied theoretical aspects of the different learning approaches (conductist, cognitive, neurocognitive, and sociocultural), but also those connectivism approaches based on the actor–network theory, which emphasize the connections, interactions, and assemblies among learners, teachers, and resources, therefore considering both learning and knowledge as a social, relational, and interactive phenomenon. The pedagogical model by Bonanno et al. (2019) considers that knowledge flows through a network of connections and that interactions producing this circulation take place in different dimensions (domain or content, technology, data networks, community, and physical space) and levels (orientation, operation, sensemaking, and innovation). This model comprises almost all interaction possibilities taking place in cyberparks, and therefore can be used to design and evaluate smart learning activities, transforming a public space -lifeless in principle- into a smart learning environment.

Museographic language in public, open-air spaces

Technologies are key tool to connect people, resources, and ideas, but without a narrative articulating them to achieve the pedagogical objectives of a cyberpark may be a difficult challenge. Through the processes of museumization and a museographic language (Fernández, 2022) the intermediation between visitors, landscape and its different elements may be attained, the latter providing historical information materialized in urban structures, edifices, streets, furniture, objects, historical events and related characters, etc.

Open-air spaces constitute a major expansion area of both museumization and didactic museographies to understand better the urban landscape, its value and monumental, environmental, and archaeological elements (Hernández, 2007). Through different and diverse didactic actions, the natural, social, historical, environmental, and socio-technical elements present in a park may interact in their own narratives on the processes occurring there; that is, on the real and tangible objects and phenomena which are the assets specific to the museographic language (Fernández, 2022). This language reflects the relationships between all objects and phenomena with the local traditions, customs, stories, and urban and cultural processes interweaved in these spaces (Layuno, 2007).

According to Busquets y Martínez (2005), actions aimed to facilitate the comprehension of natural spaces and the appreciation of the values of the natural and social heritages *in situ* are known as *interpretation*. When visitors leave a place without having understood its features, history, or the heritage preservation value, among other indicators, it is required to implement actions and strategies of pedagogical intervention and interpreta-

tion which facilitate the comprehension of the existent relationships between the different elements, as well as its space-time assessment and critical review (Busquets & Martínez, 2005). Museumization as interpretation process —that is, as set of museographic and didactical techniques applied to the urban space— allows to build meaning through narratives explaining and revealing visitors the signification of that place, its heritage importance, and the relevance of its preservation, promotion, management, and revitalization (Layuno, 2007). Como Montes and Forero (2021) point out, these green spaces -including many times nurseries, orchards, and arboreta- offer unique chances to acquire scientific and community knowledge on biodiversity and its relationship with different cultures, but also to understand the ecosystemic benefits these spaces bring to the cities.

Interpretation comprises the message, the agents involved, the selection of values inherent to the natural space to be communicated (a social process or practice, an ecosystem, a specimen, a human construction, etc.) and "todo aquello que un visitante debe recordar y entender en su visita" (Busquets & Martínez, 2005, p. 512) [all that visitors must remember and understand of their visiting experience]. By leveraging the "imágenes históricas mostrando el mismo espacio en tiempos pasados […], podemos proponer itinerarios mediante señalización" (Hernández, 2007, p. 240) [historical images of the site over time (…) new itineraries can be suggested to the visitor by means of signage], and through other numerous intermediation and smart learning resources encapsulated in an organized conceptual script which, in all, may allow visitors to articulate the information and thus know and appreciate all the elements involved.

Conclusions: Parks as smart clasrooms

The PPP (Figure 1) synthetizes and articulates the results of the documentary research of the literature published in the last two decades on the educational role of parks, allowing to situate the study of these spaces within the public pedagogy. This pedagogy operates in an implicit manner in smart cities and learning environments, in which, by generating a museographic language and a pedagogical mediation proposal, it is possible to structure smart learning networks transforming parks into cyberparks. This means to generate Smart environments from learning which offer educational experiences (Roppola, 2012) around the elements and phenomena present in each park, to acquire learnings on natural or social sciences, humanities, and art.

The PPP model offers a conceptual framework for the study and design of these pedagogical mediations, both for the ones operating in these spaces —which could be insufficient— and those which could potentially be designed to reinforce their pedagogical role. Public pedagogy defines a field of research devoted to the study or learning cities and the network of mediation actions present and possible in different contexts of the public space. In the words of Labarrere (2008, p. 91), all mediation is "es a la vez la historia y la promesa (futuro) de otras mediaciones" [the history and the future promise of other mediations].

By including smart learning as one of its apexes, the PPP highlights the importance of increasing and valuing

the number and type of possible interactions between people and contents, but also those involving physical space, technology, peers, and larger communities, in the interest of escalating the pedagogical dimension of parks. Therefore, techno-pedagogical design refers to the acknowledgement of the need to leverage the advantages offered by multiple digital tools, both for the educational approach of contents associated to the natural, cultural, and urban heritage of these spaces —often unnoticed by visitors— and the analysis of didactic interactions and interventions which make possible the educative process in these public spaces, but lack of a greater systematization and visibilization.

In light of the PPP, it is possible to elaborate methodological guidelines so that urban green spaces may classify their ongoing educational project or consolidate their own, maximizing their educational potential, as many of them do not systematically pursue the required interactions necessary to develop the different learnings which may occur in a park, in their different dimensions (historical, cultural, aesthetic, environmental, scientific, etc.). As pointed out by Santacana (2007), the needs of mediation between elements and visitors arise when the former have lost or are losing part of their meanings or they no longer generate interactions, a common situation in many parks.

Emerging museographies, didactic in nature and focused on interpretation -one of the apexes of the PPP- are presented as tools that, together with technologies, can multiply interactions and transform these spaces into open-air museums or schools, as they allow to build conceptual global narratives which provide cohesion to the elements within green urban spaces. Instead of reducing them to mere signage for spatial and cognitive orientation, the museographic language contributes to endow them with a heritage value that makes them visible, perceptible, understandable, and legible to the visitors.

The five categories of the PPP reveal how, to the extent in which spatial planning and design consider the pedagogical and educative dimension, the value placed on the other dimensions (historical, cultural, aesthetic, environmental, etc.) can be increased due to the enabling capacity of the educational process to broaden the cultural horizons of the learners and their possibilities of action, empowerment and individual and collective agency. As highlighted by the ONU (2023), exercising the right to education in its multiple spheres and modalities enables other fundamental rights, as education is a human right indispensable for the exercise of other human rights (Rodino, 2015).

The possibility of gathering learning experiences from park visitors implies to put pedagogical knowledge at the service of the urban planning, so that the inhabitants of any city can recognize, revaluate, reinterpret, and experience urban parks as places of heritage (Utrera, 2018) and, above all, as environments of learning and public pedagogy which arbitrate the processes of qualification, subjectivation, socialization, revitalization, and transformation of our identities.

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Conflict of interest statement

The author declares that she has no conflicts of interest.

Thanks