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New paradigms and concepts for urban nature: an integrative model practical applications in landscape planning education at Aalto university

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Introduction and research questions

Despite the numerous definitions of some of the new basic concepts supporting the use of urban nature in landscape and urban planning (e.g., urban green infrastructures (UGI), ecosystem services (ESS), nature-based solutions (NBS)), Urban Sustainability and Resilience (USR) project, the concept is implemented through a complementary literature review and through a comprehensive review of the above-mentioned concepts. Secondly, the model was applied to redefine the content, structure and objectives of one of the two compulsory courses (MAR_E1025 Green Area Planning) of the Aalto University master programme in Landscape Architecture. The implementation of the course during the last three years produced some tangible results that were systematically analysed to assess the level of understanding and use of the new urban-nature concepts by the students, both during the Green Area Planning course and in their future studios or master thesis.

Finally, the potential of the synthetic model and its application in landscape architecture education was discussed with a wide range of stakeholders including decision-makers from the Baltic and Finnish Cities where the students developed their work and with experts from other disciplines using mainly urban-nature concepts for analytical or planning/design purposes.

Results

A review of the novel concepts used in Urban Planning shows that they often operate at different semantic levels. These levels are better complementary or hierarchical (Table 1). As displayed in Figure 1, Urban Sustainability and Resilience can be perceived as moving processes driving the positive evolution of urban socio-ecological systems and promoting transversal and systemic ways of thinking. In the proposed model, urban Green-blue Infrastructures are mainly understood as physical and spatial networks where nature and natural processes occur in cities. From a human-centred perspective, these infrastructures have the capacity to deliver a wide range of benefits or Ecosystem Services that, if properly considered, can facilitate the assessment of Green-blue Infrastructures’ performance and integrate them in formal and informal systems (e.g. park planning and design paradigms). If knowledge is a highly interconnected web, landscape architecture education by its very nature, is located in a highly connected node and, therefore, especially sensitive to peripheral changes.

Further to the preliminary remarks: the emergence of new urban-nature related concepts, their unclear interconnections and their relevance in landscape planning and design, this paper elaborates on three Research Questions:

1. Can the new urban-nature concepts be integrated into a more coherent and synthetic model?
2. How can this synthetic model be adopted in landscape architecture education? Which kind of courses or activities could facilitate its practical use by landscape architecture students?
3. How does the synthetic model and its academic application respond to the expectations and needs of decision makers and experts from other disciplines?

Methods

The proposed Research Questions were answered using different methods. Thus, the development of a synthetic model including some of the most used urban-nature concepts (e.g., ESS, USR) was implemented through a comprehensive literature review and a complementary categorization and interconnection of the above-mentioned concepts.

The model was applied to redefine the course content, structure and objectives of one of the two compulsory courses in Urban Planning of the Aalto University master programme in Landscape Architecture. The implementation of the course during the last three years produced some tangible results that were systematically analyzed to assess the level of understanding and use of the new urban-nature concepts by the students, both during the Green Area Planning course and in their future studios or master thesis.

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together with the nature-based tools supporting its amplified performance, could be described as the overall urban nature capital.

The overall model provided the methodological and conceptual framework to work with urban nature in the course Green Area Planning (7 credits) and to support sustainable transitions in different Finnish and Baltic Cities on the base of the performance of nature and its capacity to influence on urban metabolisms, urban morphology and urban ways of living.

The development of the course included the progressive introduction of key concepts, the identification by the students of their mutual interactions, and the combination of different qualitative and quantitative methods to produce new green strategies for the studied cities and for its different functional areas, urban landscape types or typological urban fabrics. In general, the results of the course displayed a deep articulation and interconnection between all the studied concepts, a remarkable level of scalability and a high potential to facilitate the engagement of the students in wider urban discussions and urban planning challenges, both in future studies and in professional practice (Figures 2 and 3).

In particular, Figure 2 includes in its upper part a matrix with different urban green types (columns) and the ecosystem services (provisioning, regulating, cultural and overall) provided by each green type (rows), the map at the bottom of the figure shows the location of each green type in the city of Oulu (Finland).

The upper part of Figure 3 includes two sections in two districts of the city of Espoo (Finland). The pie-charts on the left illustrate the contribution of each green type to the overall green infrastructure of each district and the type of ownership. The improvements displayed in the sections produced a significant increase in the quality of the green types and of the overall green infrastructure without an increase in their respective areas. For the purpose of this exercise, it was assumed that the quality of a green area could be associated with the diversity and intensity of the ecosystem services provided by it. The same sort of approach was used in different neighborhoods of the city of Turku in Finland (see lower part of Figure 3).

Finally, the synthetic model for the integration of new Urban-Nature concepts and the proposals generated in the successive editions of the Green Area Planning course were discussed with different urban stakeholders and experts.

Discussion and conclusions
The proposed model integrates different urban-nature and sustainable-planning concepts (e.g. green-blue infrastructure, ecosystem services, nature based solutions, natural capital, socio-ecological systems, etc.) and offers a potential path to facilitate the definition of smarter and more performative natures in more sustainable cities. In addition, the developed research suggests potential improvements in the proposed model and in the applied teaching methods as well as future lines for further research.

References
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Figure 3. Expanding the performance of nature by improving the quality of the Green Infrastructure through the generation of Ecosystem Services (Espoo, Finland), Improving Green Infrastructures, Urban Metabolisms and Ecosystem Services in different urban fabrics (Turku, Finland). Students: S. Aalto, J. Jaaskelainen, D. Mavliutova and S. Palmu. Teacher: J. Galan (2017); Students: M. Paija, E. Renkoven, S. Sawada and A. Puska; Teacher: J. Galan (2016)