

PREFACE

Special issue on Smart City Learning: Opportunities and Challenges

During the last decade the promotion of new ways to teach and learn has been dramatically influenced by the use of ICT. The increased levels of flexibility and engagement provided by the intensive use of mobile and ubiquitous ICT, social media, virtual and augmented reality has fostered the adoption of new learning models in formal and informal contexts. We are witnessing how disruptive ICT is creating new teaching and learning models [1] like the flipped classroom, or MOOCs and SPOOCs. In a time where technology is everywhere, embedded not only in devices but also in physical and daily objects, and people is immersed in a participatory culture, there are endless opportunities to improve also our learning in all aspects of our daily life. To better represent the influence of ICT in lifelong learning, and in line with authors such as Luciano Floridi [2], we may say that current ICT enable not just *online* learning but actually *onlife* learning.

The development of the Internet of Things (IoT), or the Internet of Everything, is paving the way to new generations of learning applications and services, due to the expected increase in the capacity of interaction with our physical world the IoT will provide. From an interaction point of view, the Internet of the Things might be regarded as the Internet of the People (IoP) and their experiences: the focus should shift from the technology to the enhanced experiences we can support with it, and one of the most rewarding human experiences is learning. When IoT, or IoP, is combined with the potential of social computing, endless scenarios for situated, social and intrinsically motivated learning emerge.

An intensively technologically mediated territory increases the learning possibilities with strong potential impact both in formal and informal contexts. This infrastructural backbone supports the vision on Smart Cities by influencing and improving key factors like mobility, connectivity, environment, people, democratization, quality of life and governance. In Smart Cities, learning is not only a way to train an adequate human capital, but becomes one of the driving forces of the “smartness” and well being of a community. Unavoidably the underlying and ubiquitous techno-ecosystems - whose embedded intelligence, sensitivity and responsiveness surround the individuals - challenge the future of learning and call for a redefinition of spaces, contents, processes, skills and assessment approaches. Researchers need to advance and provide insights in how to deploy learned centric technologies as suggested by Christensen [1]. We have the technology, but we still need to understand which learning affordances such technologies can provide in order to support both formal and informal learning, social and situated experiences that increase learning opportunities for all in our smart city. In this special issue we have a varied collection of papers that dive deeper into such learner centric technologies in the smart city.

In “*Conceptual Modelling for Smart Cities: A Teaching Case*”, Dominik Bork et al report on opportunities and challenges of teaching conceptual modelling using Smart City scenarios. The paper provides an introduction to the theoretical approach to conceptual modelling and it then presents a case study developed to educate Master and PhD students in conceptual modelling. The case is divided into three scenarios, focusing on different ways conceptual modelling can contribute in designing a Smart City. The scenarios relate to how to model concepts of a smart city; how to analyze smart city models using query techniques; and how to process smart city models using simulation.

In “*Technology-enhanced Smart City Learning: a Systematic Mapping of the Literature*”, Gianni et al. provide a systematic mapping of the literature, offering an overview of current research in the area of smart city learning with focus on technology enabled learning situated in the city. In the paper, the authors identify common scenarios; publication patterns; technological features; adopted learning theories, approaches, and research methods. From this mapping, smart city learning is emerging as a complex form of learning, with different stakeholders, learning activities, and technological solutions combined in rich eco-systems. The mapping also points out two largely unexplored areas of technological support, namely the use of Internet of Things (IoT) and of city-related data.

In “*Citizen Science: A Learning Paradigm for the Smart City?*”, Hunt et al. consider Citizen Science from an educational perspective, and within the broad context of the smart city. Specifically, the paper illustrates the potential of the Citizen Observatory to promoting learning in formal, informal and service learning contexts. The Citizen Observatory is a framework for the definition, collection, and management of data. Data are intended to be used by local communities to construct relevant and rigorous datasets, which can be used for a variety of purposes, including education. From a smart city perspective, a citizen observatory can serve as validator for top-down approaches, but can also enable bottom-up design.

Petersen et al. explore the role of communities of interest and practice in informal learning in their paper “*Smart Neighbourhood Learning - the case of MyNeighbourhood*”. The paper describes an European project called MyNeighbourhood where four European municipalities engaged with citizens to ideate and co-design services that might foster a sense of identity and ownership. During this co-design process, authors identified a number of useful good practices that can promote individual, group and institutional learning. Such learning opportunities, which are illustrated with cases from real co-design processes that happened in the project, provide an insightful view on the role of relatively simple ICT to promote informal learning in the smart city.

In “*Smartness of Learning Ecosystems and its bottom-up emergence in six European Campuses*” Giovannella et al. report on the first validation of a benchmarking tool supporting a bottom-up approach to university ranking. The focus of the presented analysis is not on the ranking of the participating universities, but rather on the validation of the tool. The proposed approach is based: a) on the satisfaction of the

needs described by the Maslow's Pyramid, and b) on the achievement of the state of "flow" by the actors involved in the learning processes. The benchmarking approach was tested in six European Campuses by involving more than 700 students. The critical analysis of the outcomes allows the authors to identify the most relevant indicators and their correlation in order to identify and optimize the representational space.

In "*Designing Equal Participation in Informal Learning for People with Visual Impairment*", Yuan et al. apply a scenario-based analysis to identify learning opportunities for people with visual impairment. Rooting their approach in Vygotsky's Zone of Proximal Development, the authors identify a number of learning resources that can be offered to this kind of users to improve their informal learning experience whilst performing mundane activities like shopping. In particular their scenarios, derived from interviews with real users, focus on how to make available encoded practices and information, observation of practices and incidental interactions to a group of citizens who cannot access them due to their disability.

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We hope that this special issue will help readers to make sense of a challenging and still rather fragmented research field, encouraging them to contribute to it.

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References

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