

PREFACE

Smart Learning Ecosystems - Design as cornerstone of smart educational processes and places

In a people-centered perspective, to get smart, a learning ecosystem has to undergo a long evolutionary process involving a combination of co-design, participatory evaluation, and empowering steps, among other things. In this light, design literacy becomes the cornerstone for enabling and supporting this evolutionary path. Digital technologies are expected to act as empowering agents of multidimensional human well-being on that path, helping learning settings recover their central role in educating future citizens and in fostering social innovation and territorial development [1,2]. Concretizing this vision means also contributing to the reification of the United Nations 2030 Agenda for Sustainable Development Goals (SDGs) [3]. However, this is no easy task since, as UNESCO itself suggests, it involves questioning the future of "places" and learning processes, teacher education and training, learning accessibility and all those elements that can ensure learning ecosystems safeguard the well-being of the actors involved and sustain social innovation. In the organic era of interaction dominated by the pervasive presence of devices and networks, achieving SDG 4 - Quality Education, one has also to take into consideration the digital world and the skills associated with it. This notwithstanding, technologies that can in principle offer 'unlimited' possibilities are also harbingers of important criticalities, above all the sustainability of the "digital" itself.

Until now, there has been little discussion on these issues, not to mention a paucity of investigations about the interplay between digital and other competences. The digital world tends to be perceived and experienced as substitutive of reality (or at least as a discrete parallel channel), not so much as truly integrated with the physical world. Consequently, digital skills tend to be considered as those that allow you to be a successful "citizen" of the virtual world.

Never before as in these pandemic-ridden times should reflections on virtuality be so prominent in the debate on such issues, with focus on their relevance for the smartness of learning ecosystems that by *force majeure* need to maintain connection with physical reality.

Never before as in this moment must we ask ourselves what impact educational technologies have on learning ecosystems and processes, albeit virtualized ones. Technologies have ensured continuity probably thanks to the centrality of the human component, which has been able to repurpose technologies that were originally designed for socializing and collaborative work in order to support learning processes.

Never as in this moment is it so appropriate to ask ourselves what is essential and what is not, what generates impact and what can be wiped out as if it had never existed, what real possibilities we have to increase the smartness of a learning ecosystem so as to achieve "better learning for a better world", as stated in the Timisoara Declaration [4].

The discussion on the sustainability of the digital and on its effectiveness in supporting the smartness of learning ecosystems was promoted in the SLERD 2019 open debate, the aim being to stimulate curiosity and commitment for further and deeper investigations.

This IxD&A special issue represents an ideal opportunity for further reflections on these matters. The issue continues the tradition launched in 2016 by ASLERD to encourage reflections on the role technologies play in supporting the evolution of learning ecosystems towards the development of more people-centered smartness.

It should be noted that all the selected papers were prepared well in advance of the Covid19 outbreak. Nevertheless, some of the issues and reflections that emerge from the papers have recently acquired much more relevance and urgency due to the pandemic, and in some senses have also stressed the importance of developing design and meta-design competences for all actors in learning processes.

In the first of the papers selected for this special issue, the learning ecosystem is represented by the cities. The authors, Tomasz Jaskiewicz, Ingrid Mulder, Nicola Morelli and Janice S. Pedersen, explore how hackathons grounded on a co-design approach can be used to foster citizens' awareness about open data, to transfer skill sets, and empower communities with the aim of democratizing smart city services. They succeed in identifying factors that can sustain social learning ecosystems beyond hackathon events.

In the second paper, Lars Schlenker and Carmen Neuburg consider learning environments in terms of the physical spaces for vocational education, both in schools and companies. The authors concentrate on developing and testing participatory methods for designing such learning environments. They underline how learning processes can no longer be confined to specific places and physical environments, and wonder about the significance of physical environments for teaching and learning in the 21st century. The answer is a set of meta-categories in which the learning space is positioned as a "Third teacher".

In the third paper, the design focus is on the contribution that immersive virtual reality may provide in fostering appropriation of cultural heritage in young primary school children. The authors, Alessandro Luigini, Monica Parricchi, Alessandro Basso and Demis Basso, succeed in identifying aspects capable of fostering learning and demonstrate how primary school children do not consider human performance and technical aspects as separate categories.

The fourth paper focuses on another category of actors of the learning ecosystems: teachers. The authors, Margarida M. Marques and Lúcia Pombo, investigate the readiness of teachers to adopt game-based mobile learning imbued with Augmented Reality (AR). They reveal that despite the training provided and teachers' positive predisposition, the integration of advanced technologies in daily teaching routine appears somewhat problematic; this has been clearly demonstrated in the current pandemic, in which employment of such means has not been strongly encouraged nor deemed essential for the learning process. As in the past, and most likely in the future too, it will take a lot of time to integrate quite advanced technologies into schools. They are unlikely to gain widespread acceptance and take-up if not connected with popular social and/or recreational environments, as was the case with AR and the Pokémon Go game.

The authors of the fifth paper, Diana Saplacan, Jo Herstad and Zada Pajalic, focus on another critical aspect related to the adoption of Digital Learning Environments: the fragmentation of information awareness that may be induced by cross-use of a large number of different environments comprising the virtual learning ecosystem informally associated to a Higher Education institution. Once again, this is a criticality that clearly emerged during the recent lockdown period: it is difficult to adapt oneself to using a range of environments when people are not necessarily experienced users in each one. On the other hand, the adoption of one single environment may limit the pedagogical effectiveness of more advanced learning processes designed and implemented by teachers expert in technology use. The authors bring to light several causes contributing to fragmented awareness, and provide a set of recommendations to counteract this. The sixth and final paper focuses on another aspect that may also emerge in online learning ecosystems, in much the same way as it does in physical environments: the interplay between formal and informal learning. The authors, Nicolae Nistor, Mihai Dascalu and Stefan Trausan-Matu, concentrate on two specific aspects, learning guidance and onboarding newcomers. They attempt to investigate potential issues associated with these aspects, considering the case study of a Social Learning Analytics-based seminar implemented for an Educational Sciences course. The main outcomes are that: a) careful instructional design can counteract issues related to learning guidance and newcomer integration; and b) learning analytics tools could be very helpful for directing Educational Sciences students to online knowledge communities and foster their active involvement.

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