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PREFACE

Smart Learning Ecosystems beyond 2030.

This is a very special issue in the history of IxD&A journal because it carries a message to future generations that is also intended to be a legacy “in progress” - to be shaped over time - that contains operational guidelines to support the development of smart learning ecosystems till and beyond 2030. The message, composed of the Timisoara [1] and Troyes [2] (Timisoara 2.0) declarations, is the result of work shared among many colleagues and associations who are signatories of such declarations.

The effort to produce the first of these declarations was carried out in late 2015 and refined in the early 2016 for its presentation in Timisoara at the first edition of the annual conference of ASLERD [3] (SLERD [4] 2016, organized by Radu Vasiu and Diana Andone. An effort that was conducted in parallel to the definition of the SDGs by the UNESCO that included also SDG 4 [5] aimed at ensuring access to quality, equitable and inclusive education for all, a sine qua non for promoting sustainable development. Pivotal to the SDG 4 is the provision of adequate places for learning processes, and teachers with appropriate skills to provide quality education and equal opportunities for all. These are all themes that, in various ways, also resonate in the Timisoara declaration, but the latter, unlike SDG 4, addresses the issue of learning from a systemic perspective by hinging the vision on future learning in smart ecosystems, i.e. complex ecosystems composed of places, actors, processes and technologies, in osmosis with the social context towards which they act as an engine of innovation and social justice. And in doing so, the declaration identifies the features that underlie and give meaning to the term "smart" and, thus, helps to define a framework within which the degree of smartness of a learning ecosystem can be defined or, equivalently, the wellbeing generated by the ecosystem in the actors of the learning processes: students, faculty, parents, territorial stakeholders and society as a whole.

These include: the need for collaboration among traditional educational agencies, contextualized to territorial needs; the relevance of competencies and of design thinking; open access to infrastructures, technologies, contents and competencies; continuous training of all actors of the educational process also with the aim to sustain social inclusion, civic participation, community identity and social cohesion; the development of an entrepreneurial, lifelong, lifewide and lifedeep learning mind-set.

Despite the robustness of the operational framework described by the Timisoara Declaration, the events of recent years (the pandemic, the advent of climate crisis and of artificial intelligence) unavoidably had an impact on the vision contained therein and lead to its revision to provide an even more robust framework that could be still

useful well beyond 2030. Many months of work and consultations with signatory associations within the IAALDE [6] context led to the Troyes Declaration (Timisoara 2.0) presented at SLERD 2024, organized by Ines Di Loreto. Among the additional contents of version 2.0 of the declaration: the inalienable right of the individual to have access to technologies to avoid the establishment of new inequalities; the 'wellbeing' as ultimate aspiration for students, teachers, and stakeholders actively involved in educational processes; the underlining of the close link between a competencies based didactics and 'learning by being'; the responsible use of technological and natural resources; the need to develop a responsible interaction and cooperation with the artificial intelligences; the need to rethink the physical spaces to adapt them for technologically augmented educational processes aimed at 'learning by being'.
The writing of the declaration 2.0 was anticipated by an Open Debate [7] in which some representatives of the signatory associations participated. The Debate was held at SLERD 2023. The echoes of their interventions reverberate in the stimulated papers and commentary contained in this issue and help to understand how some issues can be declined in the context of smart learning ecosystems (SLEs). Indeed, SLEs are potentially ground for the development of methodologies, technologies and social innovations: for example, the use of analytics applied to the monitoring of learning but also to the assessment of the ecosystem smartness; the role of design; the use of microcredits and e-certificates anchored to blockchain; the transformation of teaching and learning processes following the introduction of AI; the experimentation on phygital spaces; the development of territorial networking and social innovation.
Examples of possible developments and of the work already underway can be found both in the stimulated contributions and in the articles selected as a result of the review process.

The paper "Grand Challenges in AI and Education Beyond 2030" [8] by Beverly Woolf, Danielle Allessio, Sai Gattupalli, Injila Rasul, William Lee, Ivon Arroyo, points out how the usage of AI requires new skills to be developed by learners, so to be able to augment their capabilities and perform jobs with more efficiency and effectiveness. To this aim, the paper lists eight grand challenges for AI in education, addressing promises and risks, suggesting problems to be addressed, and visions to foster. Ethical problems related to AI usage and the possibility that inequalities among students shall be exacerbated are also discussed.
The paper "Trustworthy Learning Analytics for SLEs" [9] by Barbi Svetec, Blaženka Divjak address the problems of trustworthiness of LA, a concept still needing clarification in order to help developing SLEs of the future. To this aim, the authors conducted a scoping literature review, then grouping identified dimensions into social and technological aspects, with some considered related to both issues. After such

analysis, a comprehensive definition of trustworthiness is provided, and open challenges are pointed out.

The commentary "Investigating Diverse Research Orientations in Smart Learning Ecosystems: Uncovering Positive and Negative Impacts on Learners' Learning Smartness" [10] by Lung-Hsiang Wong summarizes some approaches contributing to defining the future of SLEs using the three lenses of: Dream-based research, Adoption based research and Humanity based research, each of them with pros and cons. However, following new trends should not make us forget the important lessons of the past, and specifically the learners' centered approach, their active engagement, and their empowerment. In the author's opinion, future trends should be based on the distinction between adaptability and adaptivity, and on a balanced use of them by establishing suitable borders, possibly varying over time in accordance with learners' learning progress and autonomy.

The paper "Phygital learning ecosystems and places beyond 2030" [11] by Carlo Giovannella & Giuseppe Roccasalva provides a cultural reference framework for designers of tomorrow's SLEs. It contains a critical analysis on how learning environments have evolved over time, and a definition of "smartness" in LEs that is based on development of competences by learners, and wellbeing of involved actors. Cultural paradigm, pedagogical framework, and didactic approach are discussed; guiding principles and qualities that shall be adopted can be summarized in the term "Phygital", indicating physical spaces that are integrating new digital technologies.

The paper "The value perspective of technologically disrupted social dimension of a learning space" [12], by Andrea Annus, Kai Pata, Terje Väljataga, Halliki Põlda, investigates the social dimension of a learning space supporting adult education practices. The investigation took place within group-interview workshops, involving learners, facilitators and educational technologists. The outcome of this research shows that disruptive technologies enhance engagement, interactivity, effectiveness empowerment and empathy within a learning space; they also have a potential for enhancing accessibility, autonomy and equity. The downside of such technology is in privacy, surveillance, trust and coercion, that may rise questions about their use in a SLE.

The paper "More-Than-Human-Centered-Design and Self-Narration as Catalysts for fostering Sustainable Learning Ecosystems" [13], by Eugenia Rosina, Francesca Mattioli, presents an exploratory study for self-narratives, in the context of design education, and in the perspective of more-than-human-centered design, as opposed to the usual perspective of human-centered design. The latter may in fact restrict contributions to professional identity construction, in a future work environment where symbiotic relationships with non-humans may become commonplace. Exercises of self-narration involving non-human elements were thus the means of the study, aimed at raising awareness of shared agency and interconnectedness with non-humans.

Finally, the paper "Higher visual art education objectives and teaching patterns to reach them" [14], by Antonina Korepanova and Kai Pata, surveys current trends in literature about teaching visual arts in e-learning environments, by analyzing 48 research papers and interviewing 24 educators from different countries. Different teaching objectives, and different teaching patterns to achieve them, were identified; then, a visual tool was developed to categorize them as a possible help for teachers to plan their e-learning courses in accordance with their specific course objectives.

Overall, these contributions show how much the development of SLEs depends on contributions of various natures that must find common ground and ways of integration and, therefore, how useful the vision, the cultural framework and the related guidelines offered by the Timisoara and Troyes declarations are. At the same time, it makes clear how these declarations should be seen as a living legacy prone to potential modifications and additions that may become necessary as a result of evidences that may emerge from field work done to develop future SLEs.

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