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Editorial. Children's Learning with Digital Technologies

Tecnologie per l'apprendimento nell'infanzia

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This issue includes a dossier about children's learning with digital technologies, focussing in particular on early childhood (EC) education. ICTs are ubiquitous in the environment around children, and they are exposed to technologies in different contexts and ways; for this reason, concerns have been raised by parents and educators on their impact on children's health and development and the use of ICT in early childhood education has attracted a great deal of attention of different stakeholders, at educational and policy level. The use of ICT in children education, especially in EC, has been debated (Plowman & Stephen, 2003) due, indeed, to their potentially detrimental effects on children's cognitive, physical, social, and emotional development. Although concerns cannot be disregarded, the view that has prevailed over the years is that ICTs can usefully support children education provided that they are used appropriately.

A significant contribution to the field was yielded by the literature review commissioned in 2004 by the Ministry of Education of New Zealand (Bolstad, 2004), that concluded that ICT use can provide a context for collaboration, cooperation, and positive learning experiences between children, or between children and adults, as long as educators are well-aware of the kind of interaction they want to stimulate and adopt suitable pedagogical strategies to support them. An important principle expressed in the same years is that of developmental appropriateness (Siraj-Blatchford & Whitebread, 2003), which resulted in a framework based on nine general criteria to guide both teachers and decision-makers in the identification and application of the most appropriate ICT tools for EC education.

Another seminal work is the UNESCO report (2010) on ICT potential in EC education, analysing state of the art research in the field. The report highlights the capability of ICT to support some of the fundamental areas of development that should be stimulated during the preschool period (creativity, learning to learn, linguistic and mathematical skills, etc.). Besides the above-mentioned advantages, the report focuses also on the role of educators in the identification of the appropriate ICT resources and the pedagogical implications of their use. The trait d'union of these works reside not just in focusing the attention on the appropriateness of the technologies for the specific context but also on the peda-

gogical implications of technology integration in the curriculum and on the importance of educators' and teachers' professional development.

In 2015, Kerckaert and colleagues commented that, despite the open debate, research on the use of ICT in early childhood education was still in its infancy (Kerckaert, Vanderlinde, & van Braak, 2015); currently, as editors of this issue, we can observe that the call has attracted a limited number of contributions, this is perhaps indicative of the fact that, although some progress has been made, research in this specific area is not as far-reaching as in others.

This dossier stems from the efforts within the Animated Learning for Transitions - Early Recognition 2.0 (Alt-Er 2.0) Erasmus+ project[1] to stimulate the reflection on the use of ICTs and creative strategies to help children in their learning and development and includes three papers that deal with different aspects of ICT adoption.

In the first paper, Phakathi and Moll report an ethnographic study exploring the use of iPads for the documentation of *visible learning* in a classroom of a primary school where the Reggio Emilia pedagogy is applied. In the Reggio approach, pedagogical documentation is the way for making the learning process visible and is the primary methodology to grasp learning outcomes. The focus is, therefore, on the device and its affordances, analysed in the context of a well-defined pedagogical approach: as the authors point out, technology should serve pedagogy and not *vice versa*. The study suggests that the affordances of the iPad can provide students with possibilities for multimodal representations of knowledge and enhance the learning experience, in consonance with prevailing pedagogies and learning approaches. In the second contribution, Rosa investigates the use of ICT in EC education with the specific purpose of assessing geometric and emotional skills in five-year-old preschool children. The paper presents the process of assessing the usability of the software and dedicates particular attention to the organizational and educational implications of its use. Digital technologies offer interesting features for playful and interactive assessment activities and are helpful also in term of data collection and processing, but authors conclude that the development of these tools should actively involve the final users from the very beginning as they have done for Diligo 2.0. As in the first paper, there is a call by the authors for an informed use of technologies. In the third paper, Paidicán Soto and Arredondo Herrera shift the focus on teachers and report on systematic literature review, conducted on PhD thesis, concerning studies on the Technological Pedagogical Content Knowledge (TPACK) model in primary education. The model represents a reference framework for the fruitful integration of technology in teaching and learning and look at the TPACK as the specific form of knowledge resulting from the conjunction and overlap of the three knowledge domains (technological, pedagogical, and content). The authors highlight that in the panorama of the retrieved PhD theses only a limited number are focused on primary education, confirming a trend already detected in the scientific literature, and conclude that TPACK is under-investigated in this level compared to others, especially higher education.

The last two papers in this issue do not belong to the dossier. They shift the focus towards upper educational levels. Roffi and Cuomo's contribution is a scoping literature review on STEM teaching and learning with X-Reality technologies (e.g. Augmented Reality, AR, Virtual Reality, etc) in upper secondary school. The review shows that the use of these technologies for teaching STEM has been increasingly studied in the last years and the benefits are multiple both at motivational and knowledge acquisition level. In particular, what makes them powerful is the possibility they give to visualise abstract concepts that make these discipline so complex. On the other hand, authors highlight some

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[1] https://earlyeducationgame.com

drawbacks linked to technical aspects and equipment needed that might limit the spread of these technologies in schools. The fifth and last paper is focused on the university context; Ballatore, Nascimbeni, Burgos and Tabacco, present a qualitative study in which they analyse the relationship between the actual and prospective use of open education practices (OEPs) and lecturers' background and preferences in terms of teaching modalities. Researchers have found relationships between teachers' characteristics and propensity toward OEPs, in particular, teachers who exhibit a culture of sharing and have collaborative attitudes seem more likely to adopt OEPs. Interestingly, most of the respondents consider OEPs as drivers of pedagogical innovation since they foster the exchange of innovative resources and approaches among university teachers.

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