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Participatory simulation and learning process: technology matters!

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Abstract: Participatory modelling (PM) is an approach under constant renewal due to its close link to available technologies and evolution of learning habits of citizens. Since the years 2000 many PM research projects leapt into the breach of hybrid simulation to produce new modes of interaction between PM session's participants. This paper reports on the advances of participatory simulation (PS) – the branch of PM that focuses on learning by interacting with a collective simulation – on using different projection technologies for participants' interfaces. The use of two types of technologies is analyzed in this paper: ultra-short throw projector and distribution of simulation interfaces on several terminals. After a brief history of how these technologies have been used in PS applications since 2000, we conduct a comparative analysis of 5 different PS applications that use at least one of these technologies (ClimFabiam, Kulayinjana, LittoSIM, NewDistrict, ReHab). These applications have common points. PS participants are located in the same room, simulation is about a socio-ecosystem and includes different roles played by the participants, PS session aims at building collectively a scenario on the socio-ecosystem dynamics. Our findings are based on ex-post questionnaires and PS facilitators' observations. Ultra-short throw projectors enable to display a simulation interface on a table around which participants stand. This configuration favors both collective exchanges, which produces social learning, and direct human-machine interactions, which speeds up the loop of experiential learning. Distributed user interfaces enable to reinforce the asymmetry of the environment in which participants evolve during the simulation. Such configuration favors strategic behaviors by the participants and learning on how to communicate and when to interact with others.

***Keywords**:* participatory simulation, social learning, technologies, companion modelling, human-machine interaction