A Transdisciplinary Framework to Design Immersive Progressive Complexity Learning Experiences

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Abstract. The incorporation of immersive technologies in education is rising as they help students visualise abstract concepts and engage them with realistic or semi-realistic experiences. Learning experiences should be considered the backbone of an educational program, so they must be designed effectively. To prevent cognitive overload, students typically begin to work on complex problems starting with relatively simple-structured learning tasks, and, as their expertise, skill, and knowledge increase, they work on more complex endeavours to get the job done. Students in the early stages receive initial information, deep support, and guidance from the educator, and this assistance should gradually be reduced as students enhance their skills and knowledge. This work proposes that to accelerate the benefit of immersive technologies in education, instructors should use a transdisciplinary approach (considering all stakeholders, such as students, instructors, faculty, and industrial practitioners) to design immersive progressive complexity learning experiences along with dynamic guidance, appropriate support information, assessment, and feedback. The contribution of this work is twofold 1) a framework for the transdisciplinary design of immersive progressive complexity learning experiences, and 2) an illustrative instance of how to go from a simple learning task to a final complex-immersive challenge with limited additional support will be presented.

Keywords. Augmented reality, complex problems, education, gamification, immersive technologies, the case method, storytelling, transdisciplinary design, virtual reality

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