Optimal Practices in Simulation Application to Engineering Education

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ABSTRACT: As the call for technical applications to education grows, web-based, multimedia, or virtual reality tools have become hot topics in the educational sphere. This paper is aimed to explore appropriate practices in simulation application to engineering education via 2D or 3D animation clips that carve out a new dimension and generate opportunities of repeated practices in a cyberspace with less cost and more learning effectiveness. At its early stage in Taiwan now, simulation application to engineering education is often less emphasized in the academic field due to insufficient funds, inspiration, and applicable experience. As to for-profit enterprises, they need best and transferable practices and commercial incentives before they pool sources to create an attractive market. Serious and systemic commitments to the issue in question are never over-emphasized, and should be highlighted to attract academic and industry's efforts. As part of research work, this paper will give some recommendations based on what have been found in a water-related course, the subject to review and to detail in some aspects from its design, animation production, and simulation philosophy, toward goals of practicality and appropriate practices transferable and applicable to other subjects and courses. The water-related course covers a cycle of three water states, water density, water solution, and water pollution. Experiments of the course will be simulated in 2D or 3D animations to an extent that a vivid environment and objects experimented are displayed together with supportive teaching tools such as online assessment. The paper focuses on teamwork of teachers, 2D or 3D animators, web designers, and assessment professors, demonstrating joint efforts directed to explore valuable and appropriate practices for proliferation in the academic sectors and industries. In addition, any findings from this paper will try to input impetus to application innovation in engineering education.