

## Improving Trainings of Mineral Processing Operators Through Gamification and Modelling and Simulation

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**Abstract :** Within the often-hazardous mineral industry, simulation training has speedily gained appreciation as an important method of increasing site safety and productivity through enhanced operator skill and knowledge. Performance calculations related to froth flotation, one of the most important concentration methods, is probably the hardest topic taught during the training of plant operators. Currently, most training teach those skills by traditional methods like slide presentations and hand-written exercises with a heavy focus on memorization. To optimize certain aspects of these pieces of training, we developed "MinFloat", which teaches the operation formulas of the froth flotation process with the help of gamification. The simulation core based on a first-principles flotation model was implemented in Unity3D and an instructor tutoring system was developed, which presents didactic content and reviews the selected answers. The game was tested by 25 professionals with extensive experience in the mining industry based on a questionnaire formulated for training evaluations. According to their feedback, the game scored well in terms of quality, didactic efficacy and inspiring character. The feedback of the testers on the main target audience and the outlook of the mentioned solution is presented. This paper aims to provide technical background on the construction of educational games for the mining industry besides showing how feedback from experts can more efficiently be gathered thanks to new technologies such as online forms.

**Keywords :** training evaluation, simulation based training, modelling, and simulation, froth flotation

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