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Simulation versus Hands-On Learning Methodologies: A Comparative Study for Engineering and Technology Curricula

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Abstract : This paper compares the findings of two studies conducted to determine the effectiveness of simulation-based, hands-on and feedback mechanism on students learning by answering the following questions: 1). Does the use of simulation improve students’ learning outcomes? 2). How do students perceive the instructional design features embedded in the simulation program such as exploration and scaffolding support in learning new concepts? 3.) What is the effect of feedback mechanisms on students’ learning in the use of simulation-based labs? The paper also discusses the other aspects of findings which reveal that simulation by itself is not very effective in promoting student learning. Simulation becomes effective when it is followed by hands-on activity and feedback mechanisms. Furthermore, the paper presents recommendations for improving student learning through the use of simulation-based, hands-on, and feedback-based teaching methodologies.

Keywords : simulation-based teaching, hands-on learning, feedback-based learning, scaffolding
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