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# Investigating the Efficacy of Interactive Simulations (PhET) in Improving Students' Understanding of Chemistry Concepts in a Private High School in Abu Dhabi

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## Abstract

The study aims to investigate the efficacy of interactive simulations (PhET) in improving students' understanding of chemistry concepts in a private high school in Abu Dhabi. The study follows a mixed-method approach, using qualitative and quantitative data from 20 Emirati senior female participants. The participants were given a questionnaire comprising 12 Likert Scale statements addressing their attitudes and knowledge and three open-ended questions. A panel of experts validated the questionnaire. The study was conducted during the academic year of 2018-2019. Descriptive statistics and thematic analysis were used to analyze the quantitative and qualitative data collected from the participants. The findings suggest that interactive simulations such as Physics Education Technology (PhET) are effective teaching and learning tools that enhance students' confidence and enrich their learning experiences in chemistry, whether synchronously or asynchronously. Future research could further explore the potential of these simulations in strengthening critical thinking and problem-solving skills, given their alignment with the PDEODE (Predict, Discuss, Explain, Observe, Discuss, and Explain) learning model.

**Keywords:** Chemistry, Interactive Simulations, Models, PDEODE Learning Model, Physics Education Technology (PhET)