

# Virtual Learning: The Development of Case Study Based Lab Simulation in the Clinical Laboratory Science Undergraduate Curriculum

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## ABSTRACT

The goal for implementing simulation into medical laboratory education is to provide students with a highly realistic learning environment to practice “real-world” situations before starting clinical internships. To encourage higher levels of thinking during simulated scenarios, the incorporation of case studies exposes the learner to problem-based learning, which facilitates the development of critical thinking skills by tapping into the cognitive learning domain of Bloom’s taxonomy. This research project focused on developing case-study-based laboratory simulation for undergraduate clinical laboratory science students. By using case studies in laboratory-simulated scenarios, the learner engages in critical thinking/problem-solving skills by focusing on cognitive learning to evaluate, analyze, and interpret laboratory data from all major areas of the clinical laboratory as it correlates to a specific patient diagnosis. Each learning module

was based on a disease/condition the student is most likely to encounter in the hospital/laboratory setting. Learning module #1 centered on a person with type 2 diabetes with chronic renal failure and learning module #2 involved a patient with gastrointestinal bleeding caused by colon cancer. The pedagogical framework encompassed the following phases: prebriefing, analysis and test performance, student-centered discussion, and debriefing. The results of the module evaluations concluded that 100% of students strongly agreed that they learned to think critically because of the activities in learning module #2, whereas 75% of students strongly agreed (25 % agreed) in learning module #1. Using case studies, group discussions, and simulated scenarios creates a student-centered learning environment, thus allowing students to become active learners.

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