

Interactive Microbiology Simulator

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ABSTRACT

Teaching traditional microbiology in clinical laboratory science curricula presents ever-increasing challenges as laboratories close, consolidating services to fewer larger laboratories, and more laboratories transition to molecular techniques of pathogen identification. To address these challenges, a web-based simulator was designed and built. The tool uses macro- and microscopic photography, documenting phases of the identification process, and presents these in an interactive (challenge) format. Participation requires critical thinking and interpretative skills necessary to the identification as done in practice.

In the simulator, organisms are presented as unknowns to be solved. Students must assess colony morphology and interpret the Gram stain. They are then required to choose appropriate next steps in the process and, if successful, are

shown multimedia examples of that step for interpretation. Feedback is provided for all choices, and web-based flowcharts are available for coaching. Finally, video screen-casts are provided with experts providing commentary and case review, and the discussions model the critical thinking pathways, offer practical tips, warn of pitfalls, and share experience.

The result is a teaching tool that can be used both for student practice and as an assessment tool. The conclusion is that the tool could fill gaps in the current teaching environment. Future implications include adopting the tool for workforce competency assessment and/or creating a similar tool for addressing case evaluation starting from receipt of a clinical specimen.

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